

Service Manual

Cassette Deck

RS-BX701

Stereo Cassette Deck

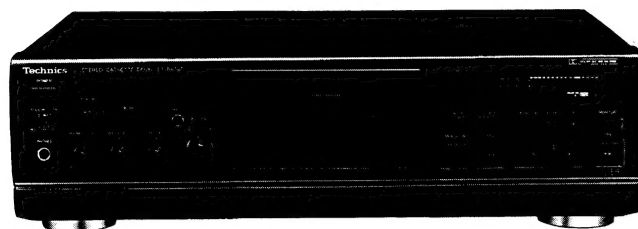


Colour

(K) ... Black Type

Area

Suffix for Model No.	Area	Colour
(E)	Europe.	(K)
(EB)	Great Britain.	
(EG)	Germany and Italy.	



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- Please file and use this manual together with the service manual for Model No. RS-BX646, Order No. AD9305159C2.
- Use this manual together with the service manual for Model No. RS-BX646, Order No. AD9305159C2.

Note: This simplified service manual is provided to indicate the main difference between the original model No. RS-BX646 (E).

CHANGES

■ CHANGE IN REPLACEMENT PARTS LIST (on pages 47, 48, 51~54.)

- Notes:**
- Mentioned in this parts list is only those different from Model No. RS-BX646 (E). All other parts are the same as for RS-BX646 (E).
 - Important safety notice:
Components identified by \triangle mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

Ref. No.	Change of Part No.		Part Name & Description	Remarks
	RS-BX646 (E)	➡ RS-BX701 (E, EB, EG)		
INTEGRATED CIRCUIT(S)				
IC1	AN7384N	AN7384N-SG	ELECTRIC VOLUME	
DIODE(S)				
D301, 302	MTZJ9R1CTA	MTZJ8R2CTA	DIODE	
D614	MTZJ8R2CTA	MA4043M	DIODE	⚠
D624	MA165	MA4043M	DIODE	⚠

Technics

Ref. No.	Change of Part No.		Part Name & Description	Remarks
	RS-BX646 (E)	➡ RS-BX701 (E, EB, EG)		
VARIABLE RESISTOR(S)				
VR703	—	EVJ02KF02B53	BIAS ADJ. CONTROL	Addition
COMPONENT COMBINATION(S)				
Z503	SVDGP1S53	—	PHOTO COUPLER	Deletion
CONNECTOR(S) AND SOCKET(S)				
CN504	REX0508	—	CONNECTOR ASS'Y (3P)	Deletion
CP504	RJP3G17ZA	—	CONNECTOR (3P)	Deletion
GND PART(S)				
E1	SNE1004-1	SNE1004-2	GND PART(S)	
RESISTORS				
R27, 28	ERDS2TJ274	ERDS2TJ563	1/4W 56kΩ	
R61, 62	ERDS2TJ471	ERDS2TJ222	1/4W 2.2kΩ	
R610	ERDS2TJ102	ERDS2TJ151	1/4W 150Ω	
CAPACITORS				
C610	ECEA1AU471	RCE1AM471BV	10V 470μF	
C618-621	ECEA1AU471	RCE1AM471BV	10V 470μF	
CABINET AND CHASSIS				
1	RHD30035-K	RHD30035-K1	SCREW	
23	RFKNBX747ECK	RYF0283-K	CASSETTE HOLDER ASS'Y	
23-1	—	RUS757ZA	SPRING, TAPE PRESSURE	Addition
24	RMB0286	—	SWITCH LEVER SPRING	Deletion
25	RMC0038	—	STABILIZER SPRING	Deletion
26	RML0308	—	DETECTION LEVER	Deletion
27	RMQ0371	—	STABILIZER	Deletion
28	RMQ0407	—	ANGLE	Deletion
29	XTB3+6J	—	SCREW	Deletion
30	XTW2+5L	—	SCREW	Deletion
32	XTW3+8J	—	SCREW	Deletion
34	RGR0169A-A1	RGR0169A-F	REAR PANEL	(E, EG)
		RGR0169A-G		(EB)
40	RFKGBX646E-K	RFKGSBX701EK	FRONT PANEL ASS'Y	
47	RGW0175-K	RGW0175-2K	KNOB, H.P. LEVEL/BIAS/BALANCE	
48	RGW0177-K	RGW0177A-K	KNOB, REC LEVEL	
MECHANISM PARTS				
129	RHG3032ZA	RMG0102-1	RUBBER CUSHION	
136	RDG0030	RDG0221	MAIN GEAR	
PACKING MATERIAL				
P1	RPG1621	RPG2094	PACKING CASE	(E, EG)
		RPG2095		(EB)
P4	XZB52X60A01Z	SPP723	PROTECTION COVER (THIS UNIT)	
P5	XZB24X34C04	XZB25X34C03Y	PROTECTION BAG (F.B. ACC.)	
ACCESSORIES				
A1	RFKSBX747E-K	RFKSSBX701E	INSTRUCTION MANUAL ASS'Y	(E)
		RFKSSBX701EG		(EG)
		RQT2527-B		(EB)

■ WRITING TO EEPROM

This unit holds recording bias and equalization data in its EEPROM, allowing playback gain and overall gain to be automatically adjusted inside the ROM. When the ROM malfunctions and requires replacement, be sure follow the instruction below.

When the head is replaced, follow steps 8 and 9 in the writing to the EEPROM procedure. (When the head is replaced, both playback gain and overall gain change and the default data must be rewritten to the EEPROM.

Measurement Condition

- Recording level control; Maximum
- Timer switch; Off
- Recording balance control; Center
- Headphones volume control; Maximum
- Test Mode terminals; Short Circuit
- Bias control; Center
- Dolby NR switch; Off
- ATC switch; Off
- Make sure heads are clean
- Make sure capstan and pressure roller are clean
- Judgeable room temperature $20 \pm 5^{\circ}\text{C}$ ($68 \pm 9^{\circ}\text{F}$)
- Power switch; Off

Measuring instrument

- EVM (Electronic Voltmeter)
- Oscilloscope
- AF oscillator
- ATT (Attenuator)
- Resistor (600Ω)

Note: Before writing data to the ROM, be sure to set the AF oscillator output level to 0dB (1 kHz)=1V.

Test tape

- Overall gain adjustment
- Normal reference blank tape; QZZCRV2
- CrO₂ reference blank tape; QZZCRX1
- Metal reference blank tape; QZZCRZ5

Note: Step 1 to step 7 only has to be done after exchange of the EEPROM.

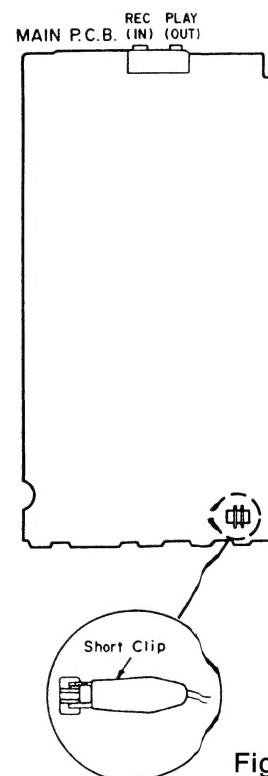
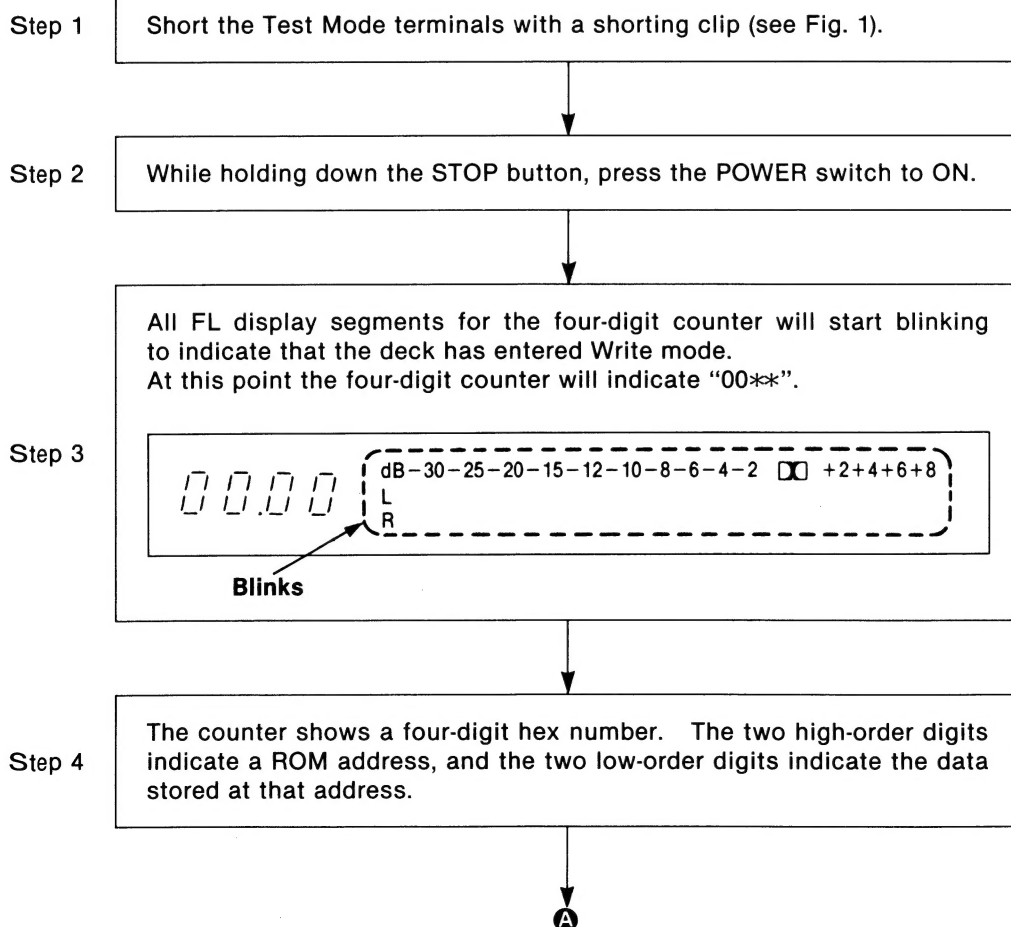


Fig. 1

Notes:

- The test mode terminals on main P.C.B. should be shorted with a short clip as shown above figure.
- After the adjustment items disconnect the short clip.

A

00 00
H L
i o
g w

Set these digits using the FF or REW button. The high- and low-order digits of the address increase each time the FF button is pressed. The REW button decreases these digits. For fast incrementing or decrementing, hold down the FF or REW button.

Set these digits using the PAUSE or REC button. The high- and low-order digits of the data increase each time the PAUSE button is pressed. The REC button decreases these digits. For fast incrementing or decrementing, hold down the PAUSE or REC button.

Example: Set "00" in address 14 (see Fig. 3).

14.00

Set these digits to "00" using the PAUSE or REC button.

Set these digits to "14" using the FF or REW button.

* The data writing process is complete when the next address number appears. For example, writing of the data 14.00 has been completed when the address 15 is displayed.

Step 5

Step 6

Set data (see Fig. 3) to addresses 14, 08 through 7F, 00 (total 90 data to be set). After this, set "00" (end) in address 00 and exit from Write mode.

After completing ROM writing, press the STOP button to restore the normal Test mode. The four-digit counter displays.

Step 7

0000 dB-30-25-20-15-12-10-8-6-4-2 ☐ +2+4+6+8
L R

Blinks

PLAYBACK GAIN

- Set the AF oscillator's output frequency to 315Hz/-20dB (100mV) (see Fig. 2).
- With no tape loaded in the deck, press and hold the REC button. Adjust the test signal level using the Rec. Level and Balance controls until the line output levels on both channels are 320mV. When the adjustment is complete, release the REC button. (The deck stores the data at the moment the REC button is released.)
- Load the test tape, QZZCFM, into the deck and locate the section of the tape where the playback gain test tone (315Hz, 0dB) is recorded, then playback the portion. Press the ATC button, and the display will flash ATC MEMO slowly, meaning that playback gain is being automatically adjusted. Press the play button. (At this point the deck automatically adjusts playback gains.) After this playback the tape and verify that the output level falls in the specified range.

Standard value: 320mV ± 0.5dB

Note: If adjustment of PLAYBACK GAIN fails, the display will flash ATC MEMO rapidly. After a successful adjustment, the display will no longer show ATC MEMO.

B

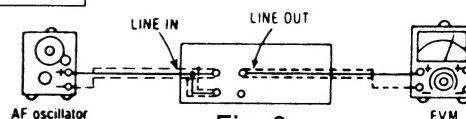


Fig. 2

INITIAL SETTING UP FOR OVERALL GAIN AND OVERALL FREQUENCY RESPONSE

B

Step 9

- Load a Normal blank test tape (QZZCRV2) into the deck under test. Press the ATC button, then the REC button. The display will flash ATC MEMO slowly. (At this point the deck automatically adjusts the overall gain and frequency response.)
 - After the above setting, the overall gain for selection of CrO₂ and Metal tape will be automatically set by the ROM and stored in the ROM.
- Note:** If adjustment of OVERALL GAIN or OVERALL FREQUENCY RESPONSE fails, the display will flash ATC MEMO rapidly. After a successful adjustment, the display will no longer show ATC MEMO.

Step 10

Remove the shorting clip from the Test Mode terminals. The FL display will stop blinking.

• EEPROM MAP

Low \ High	0	1	2	3	4	5	6	7
0	00	—	60	8E	94	—	—	—
1	—	—	83	94	9A	—	—	—
2	—	—	34	1E	1A	—	—	—
3	—	—	6F	7F	8E	—	—	—
4	—	08	C0	BF	B8	60	8E	9D
5	—	20	7C	74	6F	83	98	9D
6	—	12	60	8E	9D	44	1E	1A
7	—	07	83	98	9D	64	6A	79
8	—	FB	44	1E	1A	C0	BF	BC
9	—	F5	5A	62	73	—	—	—
A	—	5E	C0	BF	BC	26	30	80
B	—	99	88	87	88	7C	7D	7D
C	—	50	8C	8C	94	70	6B	6B
D	—	7C	0F	0E	0D	83	83	83
E	—	4B	95	96	97	—	FF	01
F	—	51	0E	0D	0D	—	—	00

Fig. 3

Note: At an address with no data value indicated (e.g. 01 → —), the ROM operates normally irrespective of the kind of the data supplied.

MEASUREMENTS AND ADJUSTMENTS

Measurement Condition

- Recording level control; Maximum
- Timer switch; Off
- Recording balance control; Center
- Headphones volume control; Maximum
- Bias control; Center

- Dolby NR switch; Off
- ATC switch; Off
- Make sure heads are clean
- Make sure capstan and pressure roller are clean
- Judgeable room temperature $20 \pm 5^{\circ}\text{C}$ ($68 \pm 9^{\circ}\text{F}$)

Measuring instrument

- EVM (Electronic Voltmeter)
- Oscilloscope
- Digital frequency counter

- AF oscillator
- ATT (Attenuator)
- Resistor (600Ω)

Note: Before adjustment, be sure to set the AF oscillator output level to 0dB (1kHz)=1V

Test tape

- Head azimuth adjustment (8kHz, -20dB); QZZCFM
- Tape speed adjustment (3kHz, -10dB); QZZCWAT
- Playback frequency response (315Hz, 12.5kHz, 10kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz, 63Hz, -20dB); QZZCFM
- Playback gain adjustment (315Hz, 0dB); QZZCFM

- Overall gain adjustment and Overall frequency response, AC bias trap adjustment and HX PRO adjustment.

Normal reference blank tape; QZZCRV2

CrO₂ reference blank tape; QZZCRX1

Metal reference blank tape; QZZCRZ5

Adjustment Points

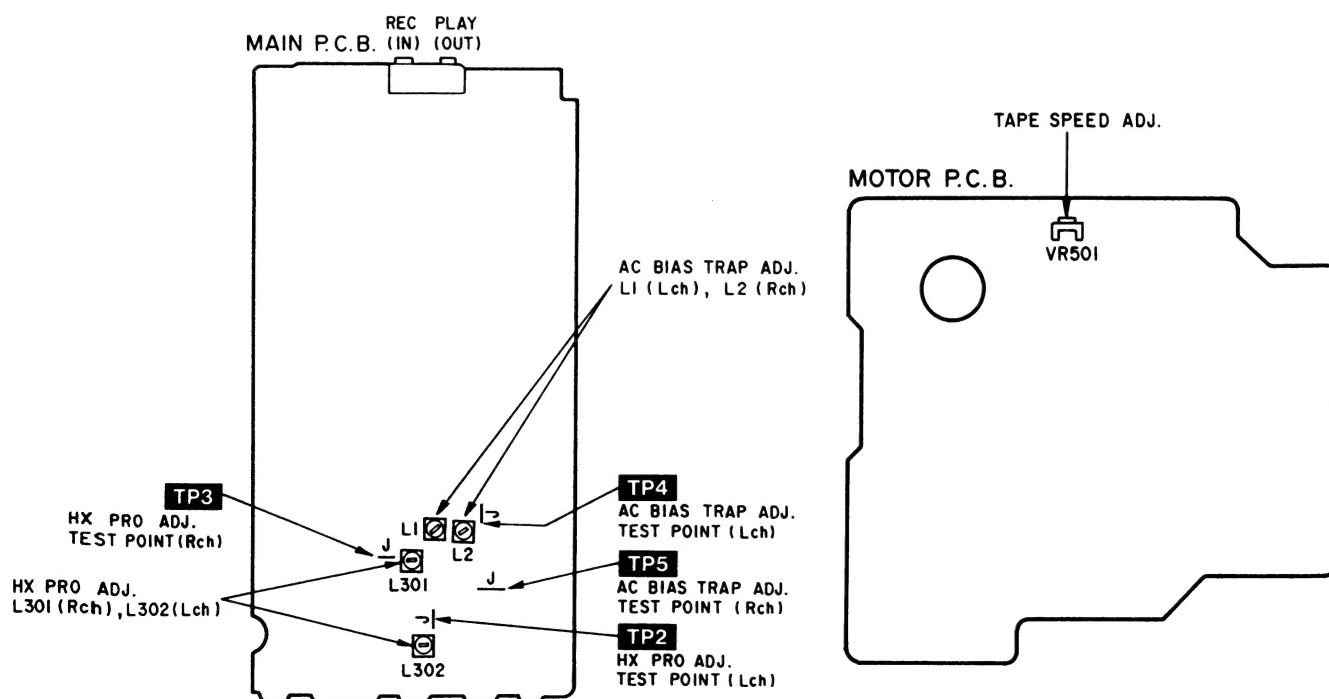
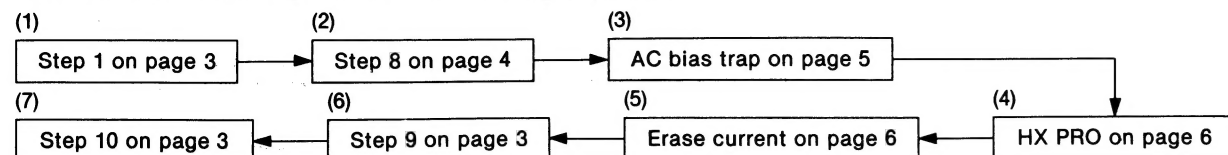


Fig. 4

HEAD REPLACEMENT

When replacing the R/P head or E head, adjust the head azimuth (erase head with small screw stop does not need adjustment) then start the EEPROM adjustment in the following sequence.



(The adjustment is necessary because the playback gain, the overall gain, and the overall frequency response are changed by the head replacement.)

HEAD AZIMUTH ADJUSTMENT

Caution:

- Please replace both azimuth adjustment screws (QH1361A) and springs (QBC1278A) used for to new ones simultaneously when readjusting the head azimuth. (See Fig. 6.) Even if you wish to readjust the head azimuth without replacing the screws and springs, a fine adjustment can not be done because of the screw-locking bond adhered to the azimuth screw and spring.
- Please remove the screw-locking bond left on the head base when replacing the azimuth screw.
- If you wish to readjust the head azimuth, be sure to adjust with adhering the cassette tape closely to the mechanism by pushing the center of cassette tape with your finger. (Shown in Fig. 7.)

1. Playback the azimuth adjustment portion (8kHz, -20dB) of the test tape (QZZCFM). Vary the azimuth adjusting screw until the output of the R-CH are maximized. (See Fig. 5)
2. After the adjustment, apply screwlock to the azimuth adjusting screw. (See Fig. 8)

When the head azimuth is adjusted after head replacement, follow the Writing to the EEPROM procedure on page 4 and 5 (steps 8 and 9).

(When the head is replaced, both playback gain and overall gain change and the default data must be rewritten to the EEPROM.)

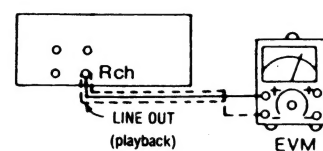


Fig. 5

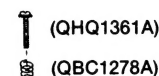


Fig. 6

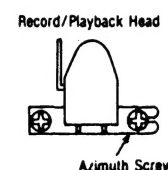


Fig. 8

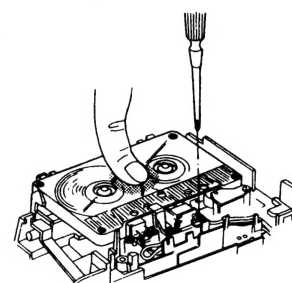


Fig. 7

TAPE SPEED ADJUSTMENT

Normal speed (Standard Value: 3000 ± 45 Hz)

1. Playback the middle portion of the test tape (QZZCWAT).
2. Adjust VR501 for the output value.

Adjustment target: 3000 ± 15 Hz

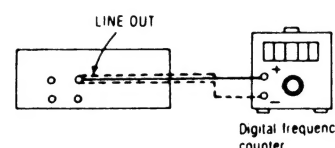


Fig. 9

PLAYBACK GAIN MEASUREMENTS

1. Load the test tape (QZZCFM) into the deck and locate the part where the playback gain test tone (315Hz, 0dB) is recorded. After this, play back the tape and verify that the output level falls in the specified range.

Standard value: 320mV ± 0.5dB

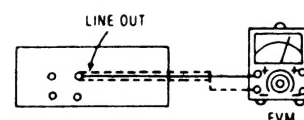


Fig. 10

AC BIAS TRAP ADJUSTMENT

1. Insert the Metal blank test tape (QZZCRZ5) and set the unit to the Record mode.
2. Adjust L1 (L-CH) [L2 (R-CH)] so that the output voltage between TP4 (L-CH) [TP5 (R-CH)] and GND so that the output is the minimum value.

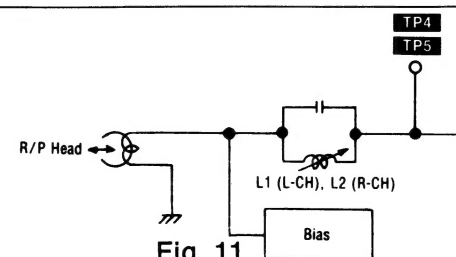


Fig. 11

HX PRO ADJUSTMENT

1. Insert the Metal blank tape (QZZCRZ5) and set the unit to the Record Pause mode.
2. Connect a DC voltmeter across TP2 (L-CH) and GND, TP3 (R-CH) and GND.
3. Adjust L301 (L-CH) and L302 (R-CH) so that the output is the minimum value.

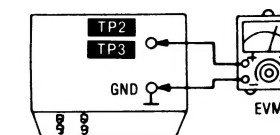


Fig. 12

PLAYBACK FREQUENCY RESPONSE

1. Playback the frequency response portion (315Hz, 12.5kHz ~ 63Hz, -20dB) of the test tape (QZZCFM).
2. Assure that the frequency response is within the range shown in Fig. 15 for both L-CH and R-CH.

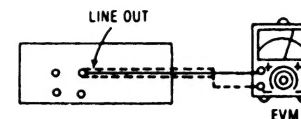


Fig. 13

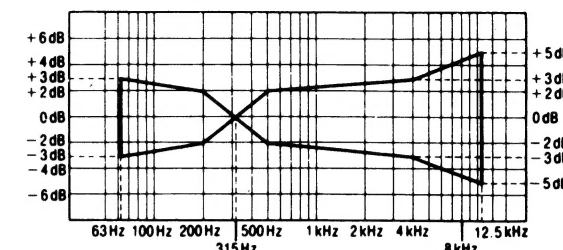


Fig. 14

ERASE CURRENT ADJUSTMENT

1. With no tape loaded in the deck, press the Record button.
2. Check if the output at this time between the erase current confirmation point TP1 and GND (chassis) is within the standard value.

Standard value: 190 ± 20 mA (Metal)...EVM Reading: 190 ± 20 mV

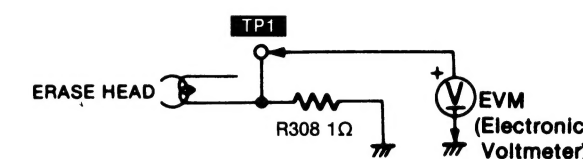


Fig. 15

CONFIRMATION OF THE OVERALL GAIN AND OVERALL FREQUENCY RESPONSE

1. In the Record Pause mode, load a normal blank tape (QZZCRV2) into the deck, and apply the reference input signal (1kHz, -24dB) to the Rec. input. Adjust the output to 320mV with the attenuator, and start recording.
2. While playing back the reference signal just recorded, verify that the output level falls in the following range.

Standard value: 320mV ± 0.5dB

3. Afterward, apply a signal (frequency at the measured point in the range from 50Hz to 10kHz), whose level is 20dB lower than the reference signal level (1kHz, -24dB=approx. 63mV), to the Rec. input. Then start recording with a normal blank tape (QZZCRX1).
4. Play back the test signals just recorded and verify that the levels at the test frequencies fall in the ranges specified in Fig. 17 with respect to the reference signal level.
5. Repeat steps 3 and 4 above for CrO₂ blank test tape (QZZCRX1) and Metal blank test tape (QZZCRZ5), in these cases raising the upper end of the test signal frequency range to 12.5kHz. Verify that the signal levels at the test frequencies fall in the ranges specified in Fig. 18 with respect to the reference signal level.

Steps 1 through 2 above are concerned with overall gain; steps 3 through 5 pertain to overall frequency response.

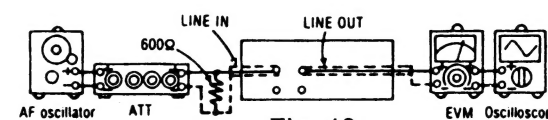


Fig. 16

Normal Overall frequency response chart (NR OUT)

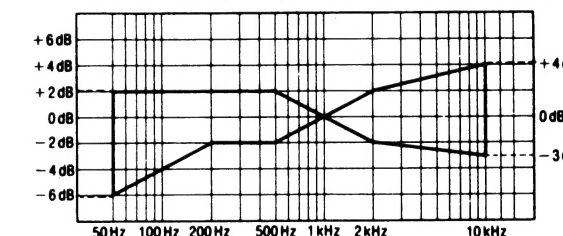


Fig. 17

CrO₂ Metal Overall frequency response chart (NR OUT)

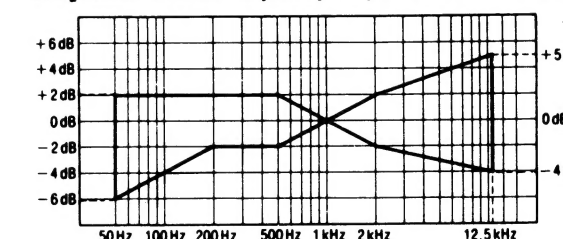
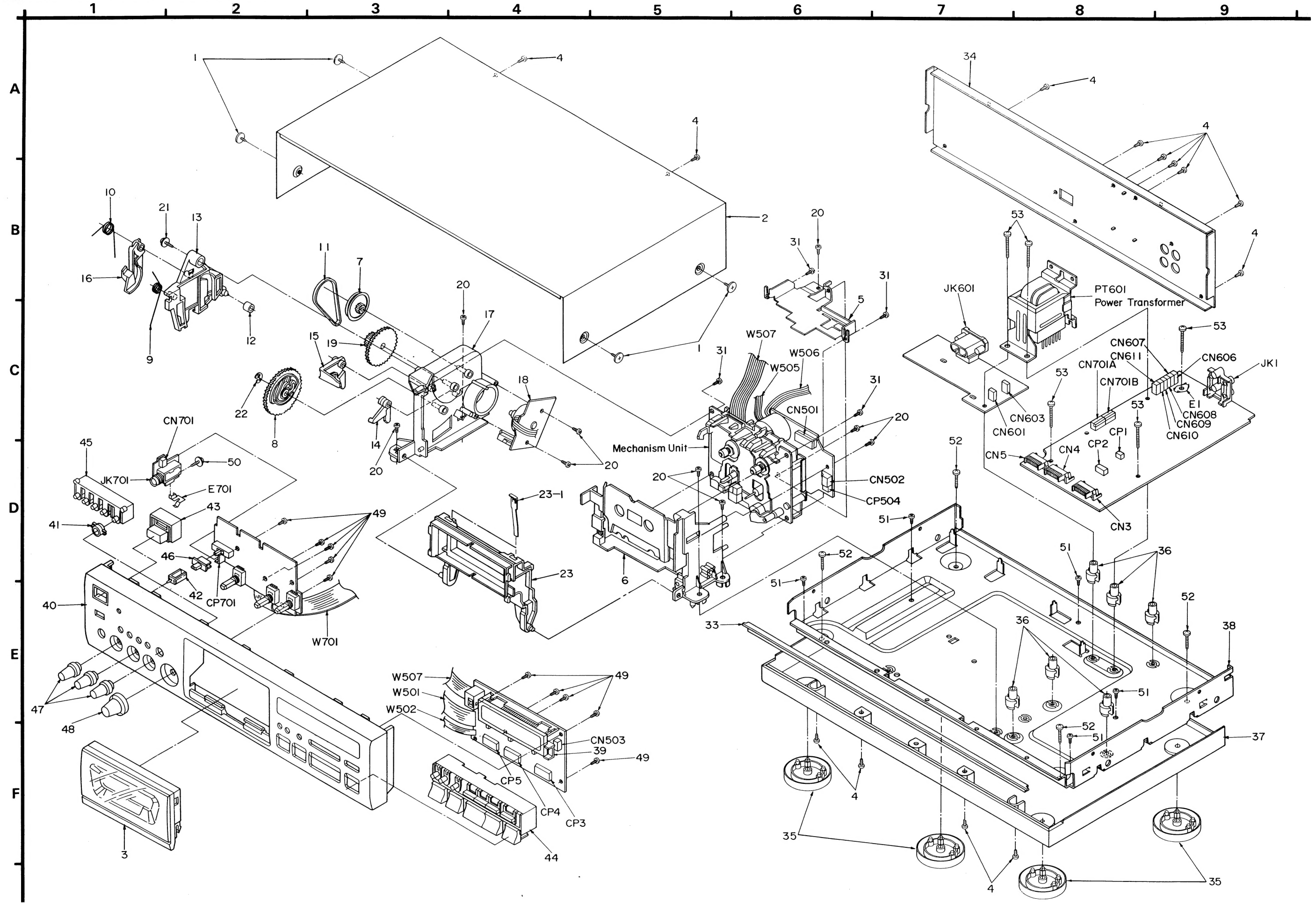
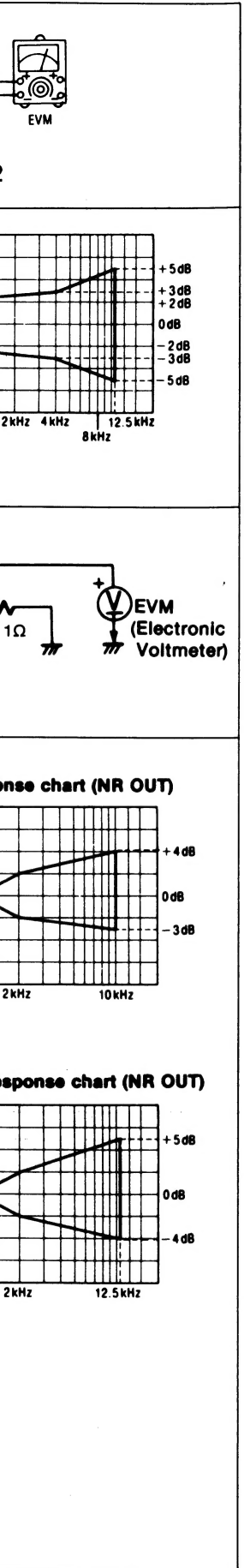


Fig. 18

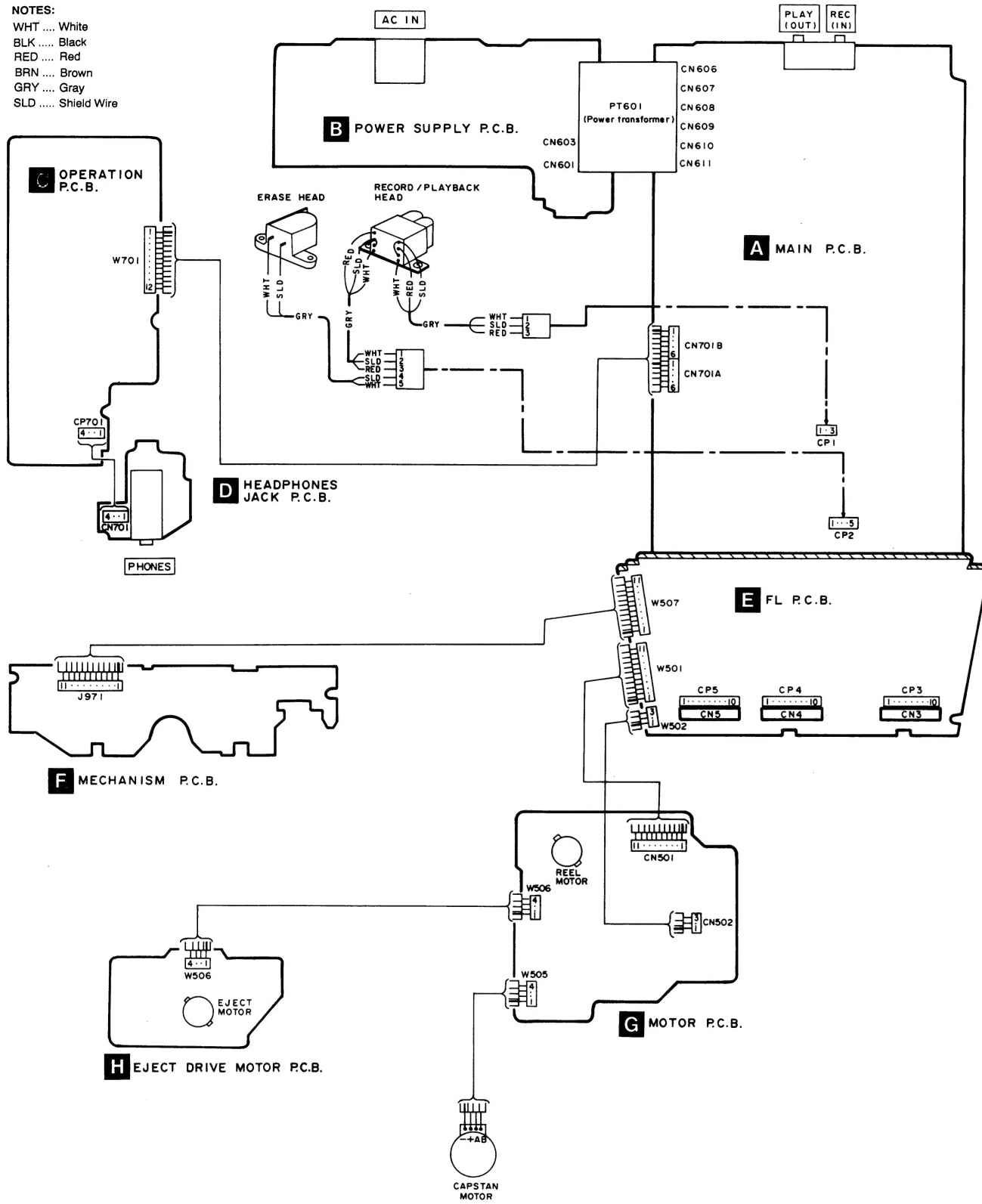
CABINET PARTS LOCATION



WIRING CONNECTION DIAGRAM

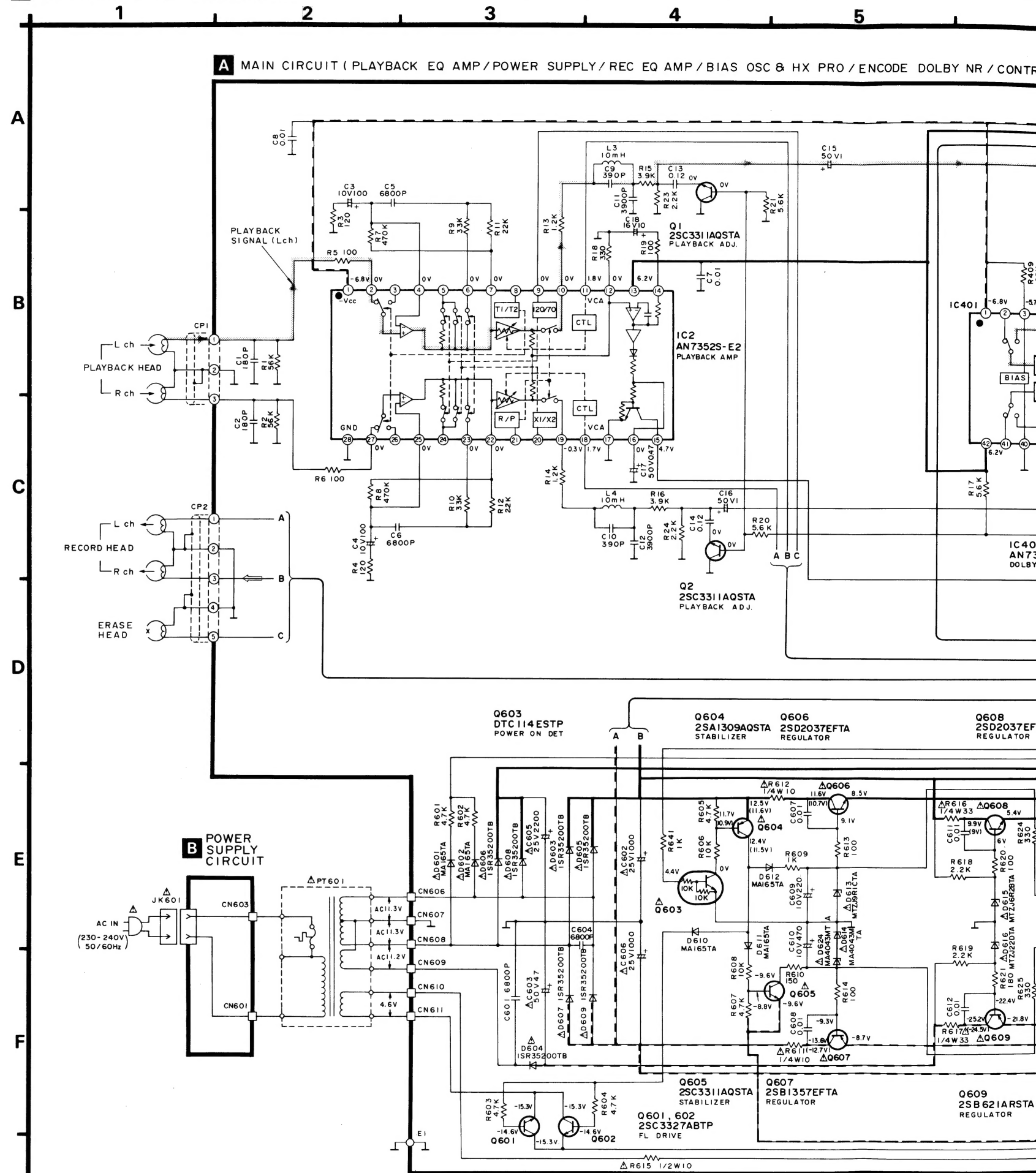
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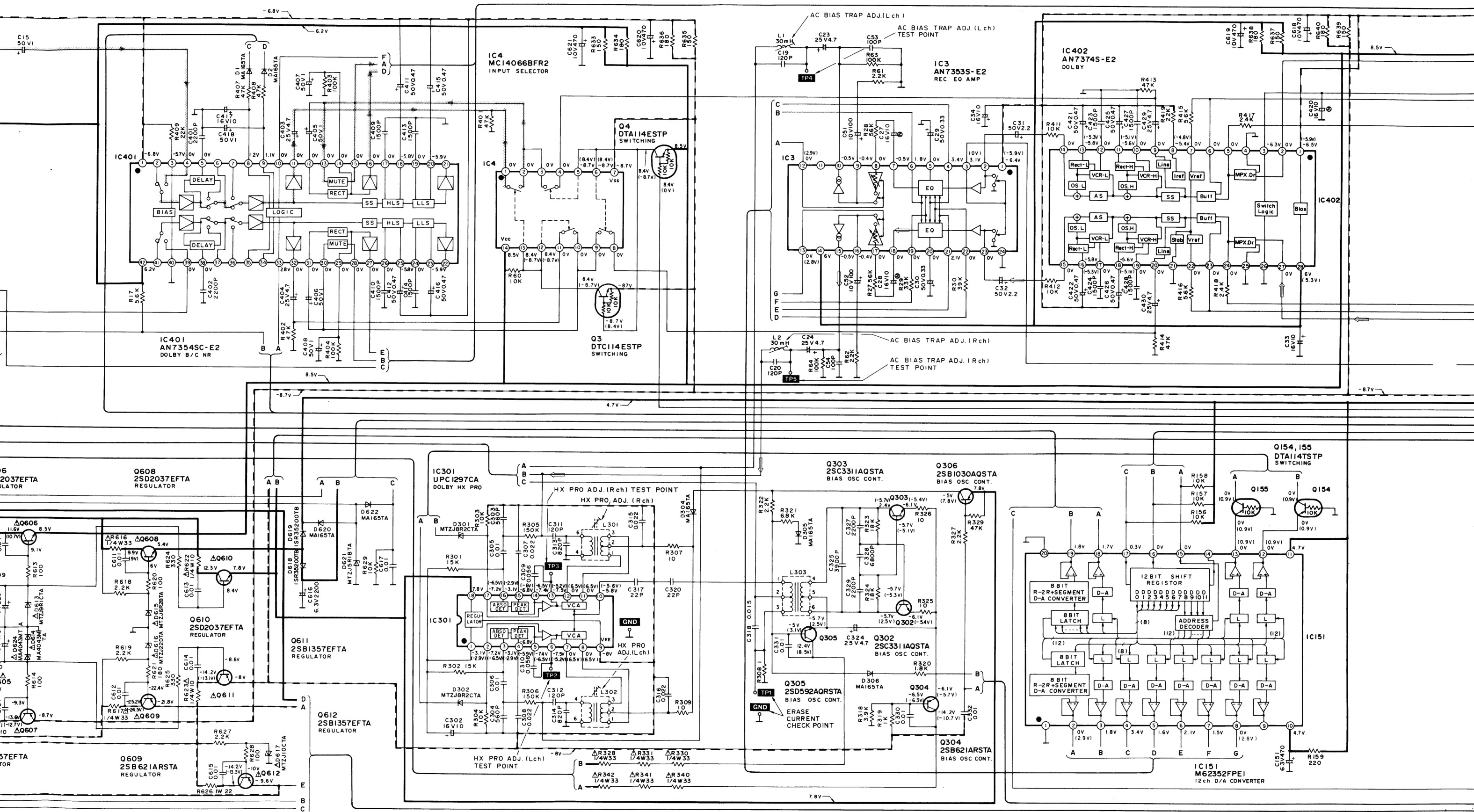
WHT White
BLK Black
RED Red
BRN Brown
GRY Gray
SLD Shield Wire

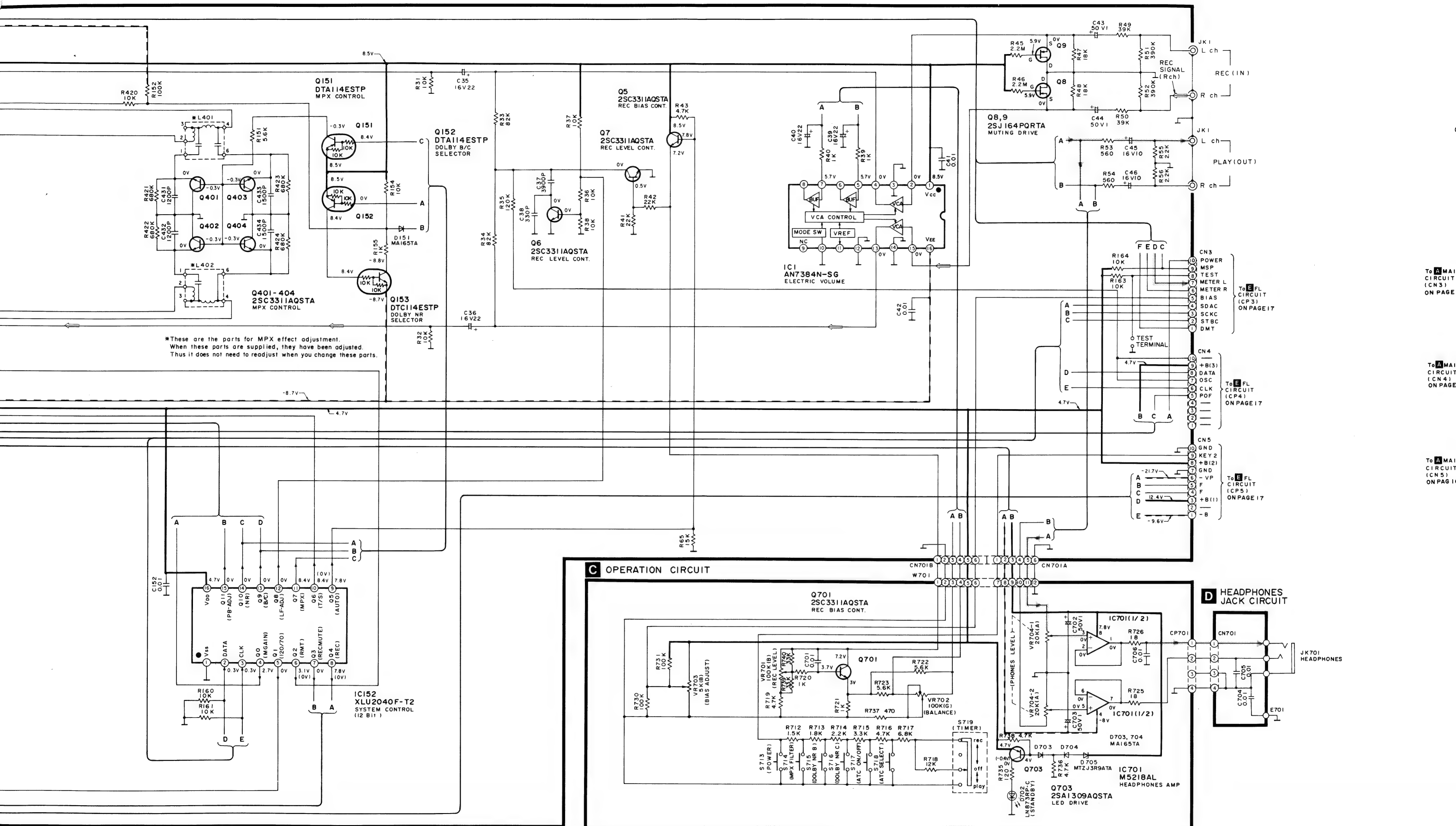


SCHEMATIC DIAGRAM

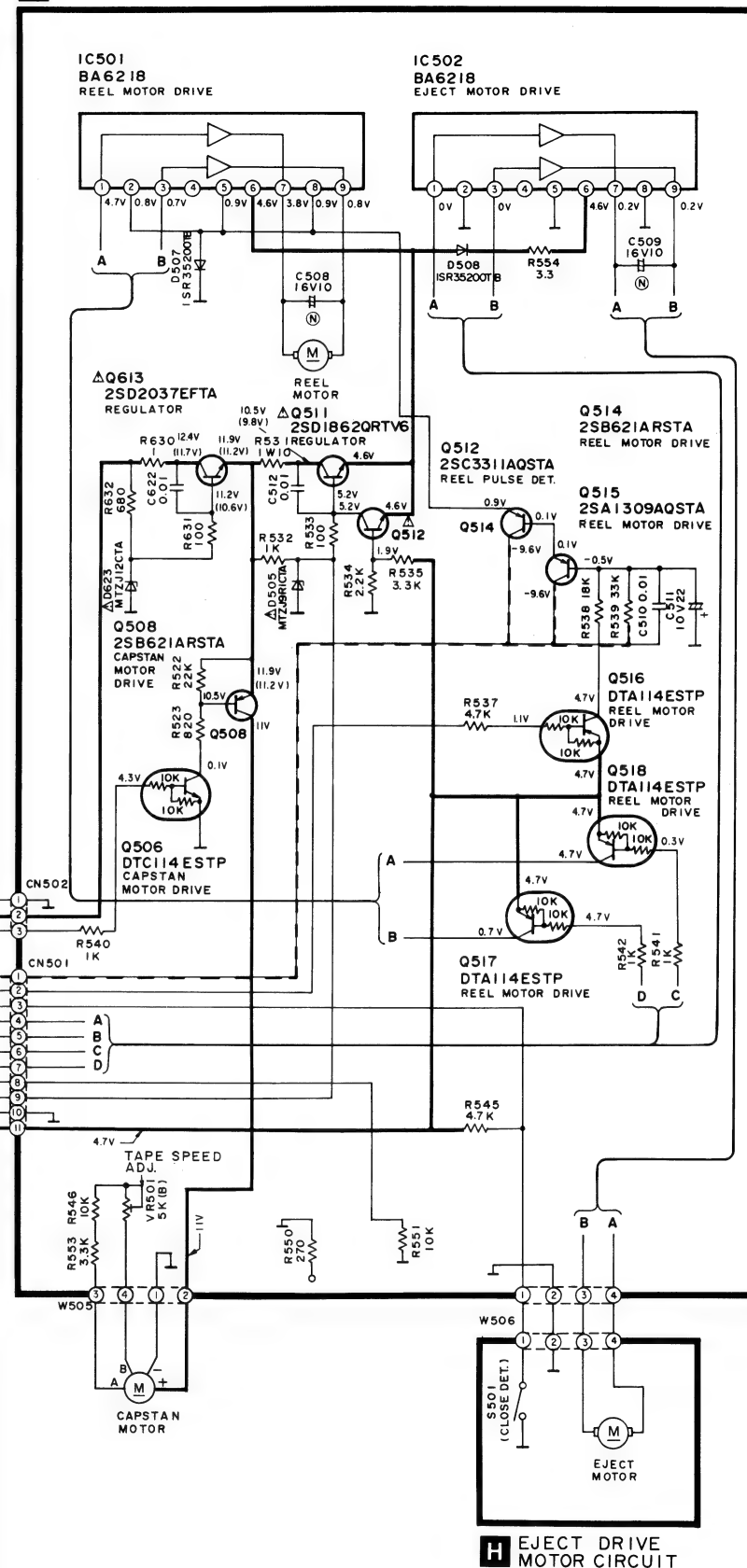
Note: This schematic diagram may be modified at any time with development of new technology.





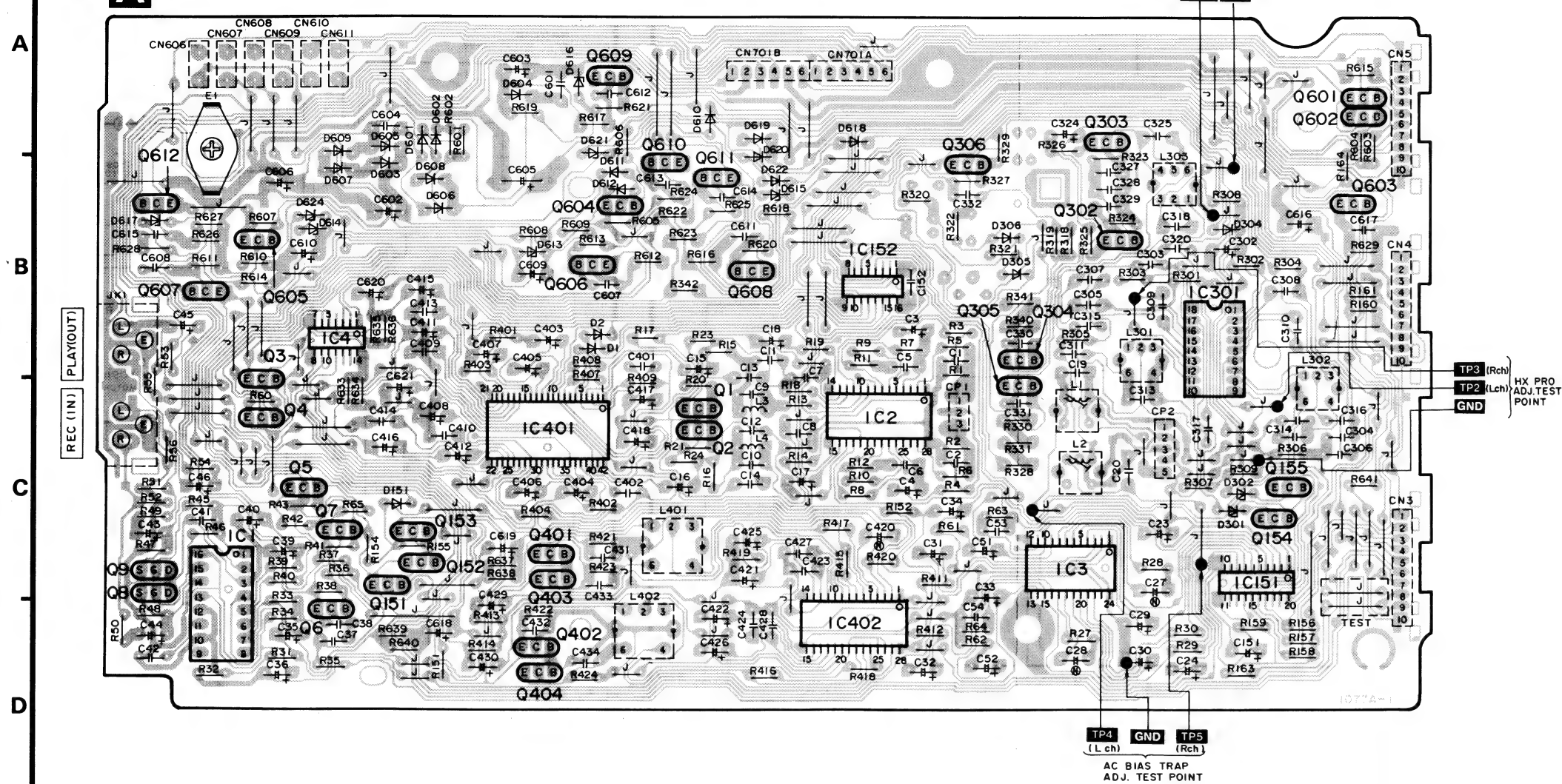


G MOTOR CIRCUIT

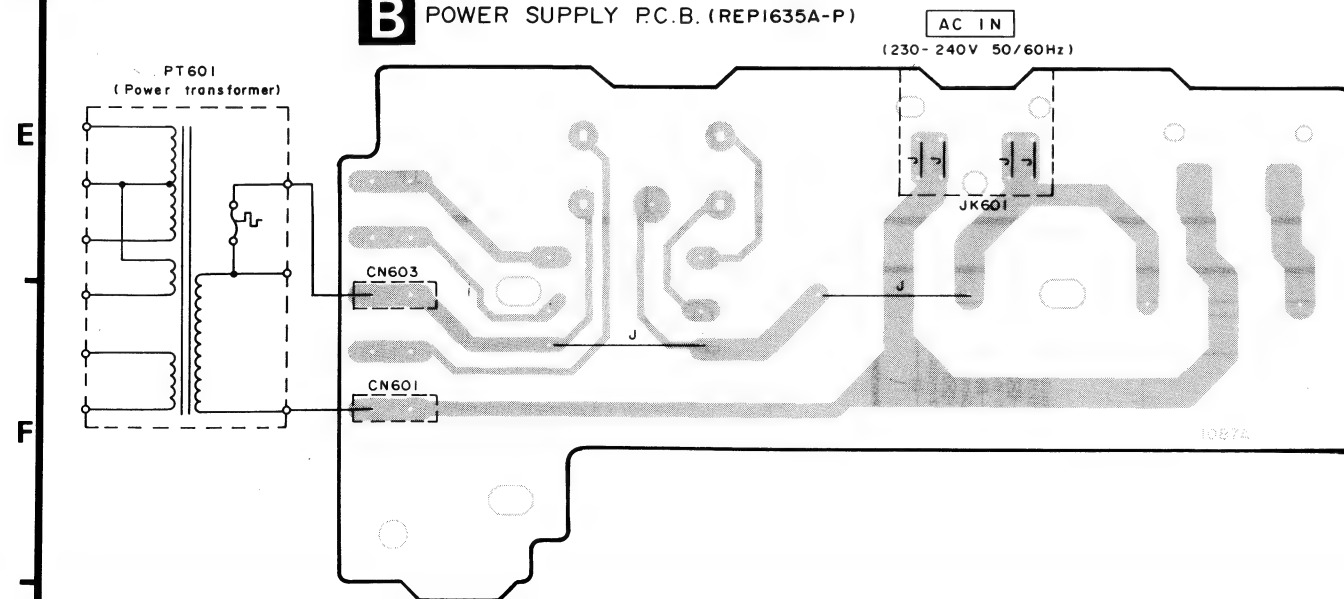


H EJECT DRIVE MOTOR CIRCUIT

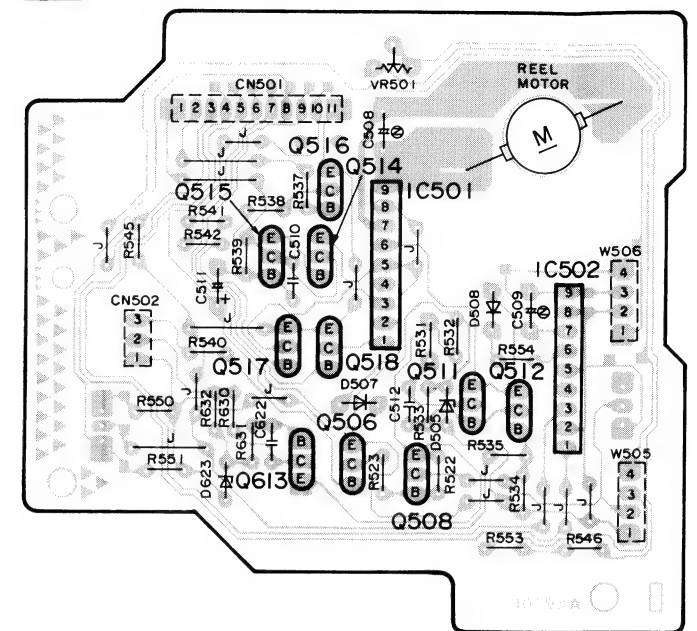
A MAIN P.C.B. (REPI632A-M)



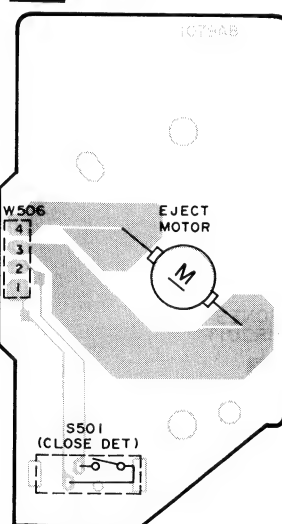
B POWER SUPPLY P.C.B. (REP1635A-P)



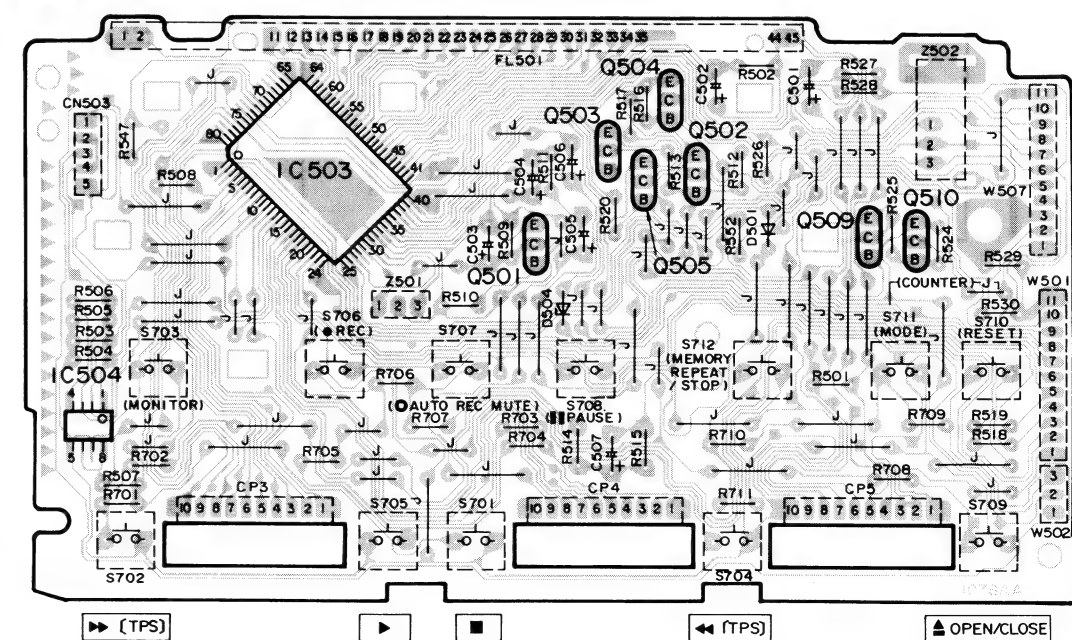
G MOTOR P.C.B. (REP1634D-T)



H EJECT DRIVE MOTOR
P.C.B. (REP1634D-T)

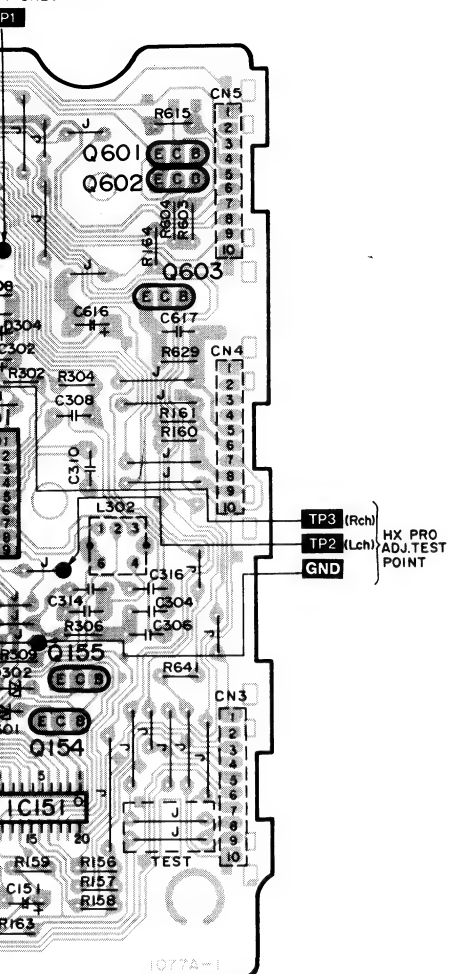
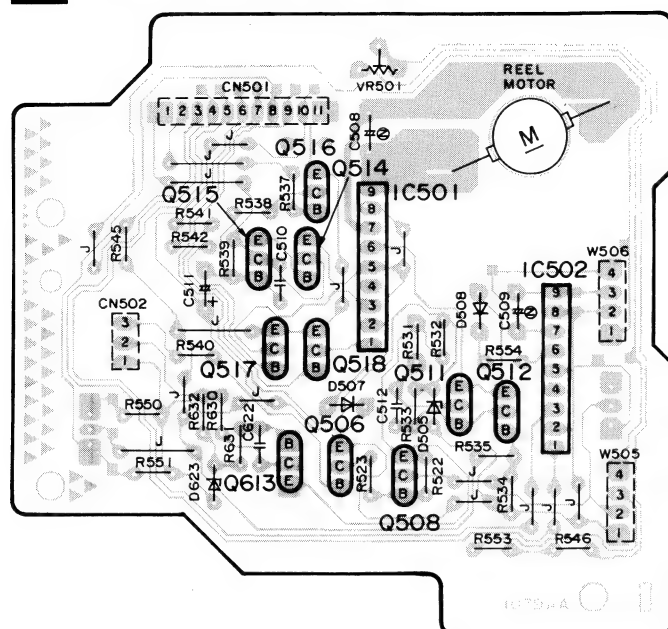
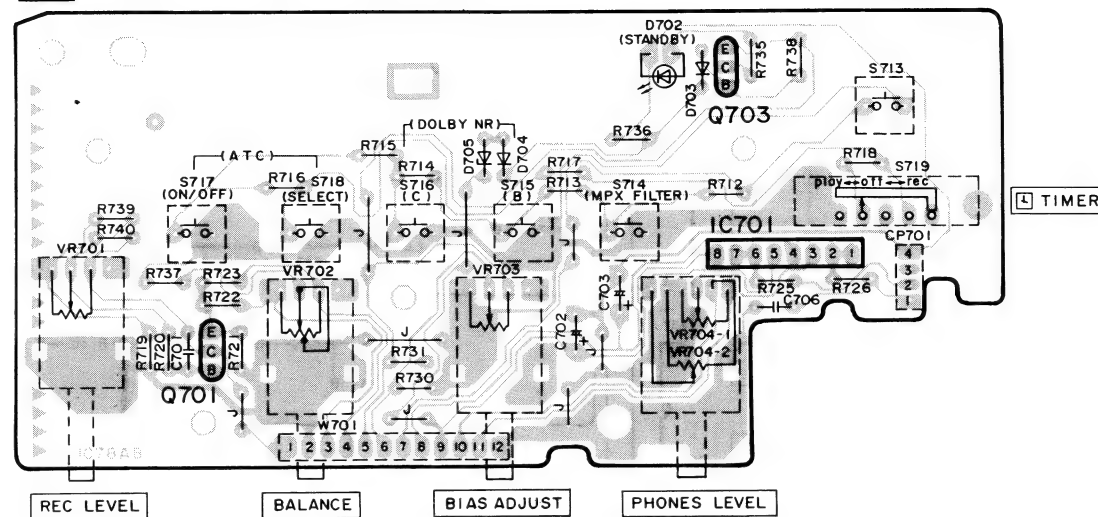
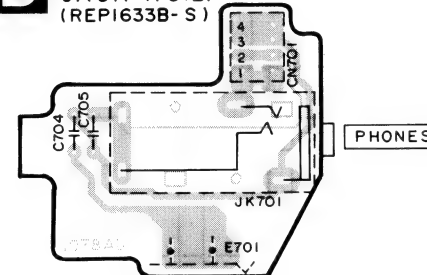
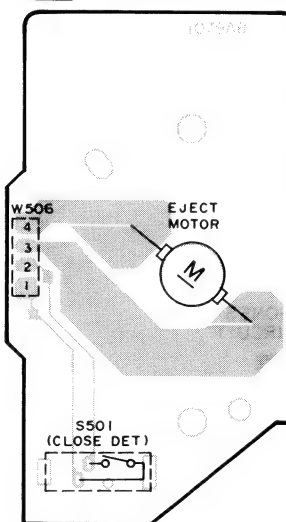
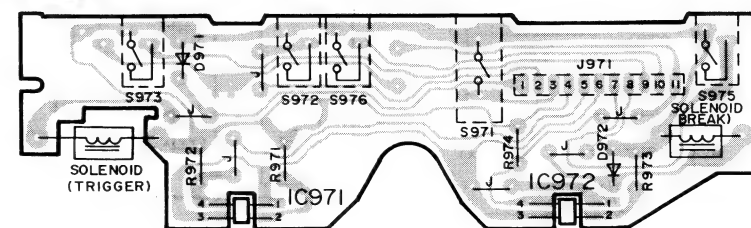
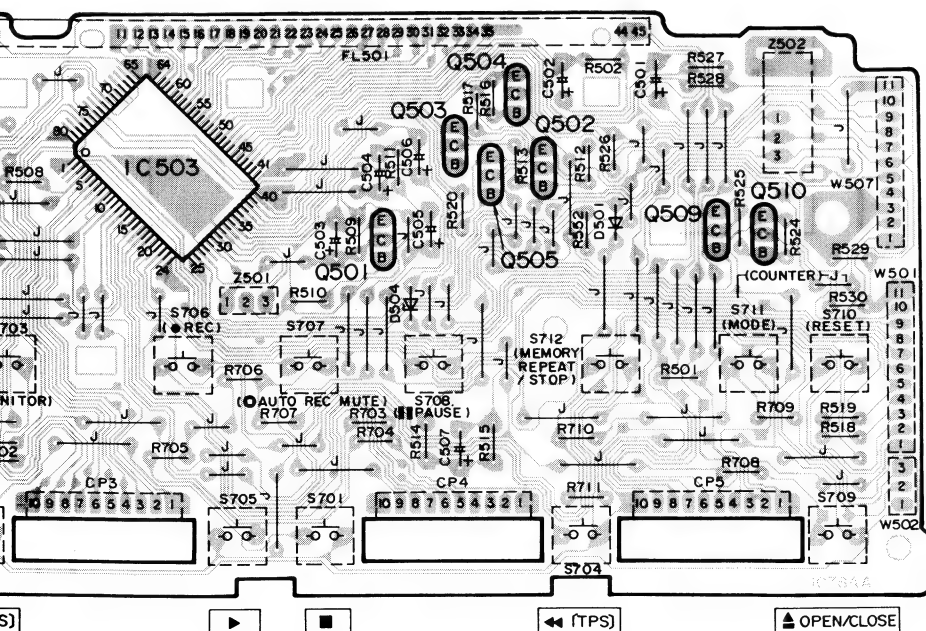


F FL P.C.B. (REP1633B-S)



6 7 8 9 10 11 12 13 14

T CHECK POINT

**G** MOTOR P.C.B. (REP1634D-T)**C** OPERATION P.C.B. (REP1633B-S)**D** HEADPHONES JACK P.C.B. (REP1633B-S)**H** EJECT DRIVE MOTOR P.C.B. (REP1634D-T)**F** MECHANISM P.C.B. (REP0267)**C** B. (REP1633B-S)

Service Manual

Stereo Cassette Deck

Cassette Deck

RS-BX646



Colour

(K) ... Black Type

Area

Suffix for Model No.	Area	Colour
(E)	Europe.	(K)
(EB)	Great Britain.	
(EG)	Germany and Italy.	

* Dolby noise reduction and HX PRO headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX PRO originated by Bang and Olufsen. "Dolby", the double-D symbol, and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

RS-TR555 MECHANISM SERIES (AR350)

SPECIFICATIONS

■ CASSETTE DECK SECTION

Deck system	Stereo cassette deck
Track system	4-track, 2-channel
Recording system	AC bias
Bias frequency	80 kHz
Erasing system	AC erase
Heads	Recording head [Permalloy (combination)] × 1 Playback head [Permalloy (combination)] × 1 Erasing head (Double-gap ferrite) × 1
Motors	Capstan drive (DC SERVO MOTOR) × 1 Reel table drive (DC MOTOR) × 1 Cassette holder open/close (DC MOTOR) × 1
Tape speed	4.8 cm/sec. (1-7/8 ips)
Wow and flutter	0.07% (WRMS) ±0.2% (DIN)

Fast forward and rewind times

Approx. 50 seconds with C-60 cassette tape

Frequency response (Dolby NR off)

NORMAL	30 Hz–17 kHz, ±3 dB 20 Hz–18 kHz (DIN)
CrO ₂	30 Hz–18 kHz, ±3 dB 20 Hz–19 kHz (DIN)
METAL	30 Hz–19 kHz, ±3 dB 20 Hz–20 kHz (DIN)

S/N (Signal level=max recording level, CrO₂ type tape)

NR off	57 dB (A weighted)
Dolby B NR on	66 dB (A weighted)
Dolby C NR on	74 dB (A weighted)

Input sensitivity and impedance

REC (IN)	10 mV/47 kΩ
----------	-------------

Output voltage and impedance

PLAY (OUT)	5.0 mV/500Ω
HEADPHONES	90 mV/(8Ω) (Load impedance: 8Ω–600Ω)

■ GENERAL

Power consumption	21 W
Power supply	AC 50 Hz/60 Hz, 240 V—240 V
Dimensions (W×H×D)	430×155×293 mm
Weight	4.6 kg

Note:

Specifications are subject to change without notice.
Weight and dimensions are approximate.

Technics

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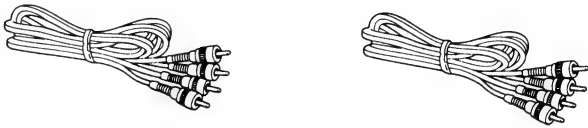
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ACCESSORIES

AC power supply cord 1 pc.
(VJA0733)..... (EB) (RJA0019-2K) (E, EG)

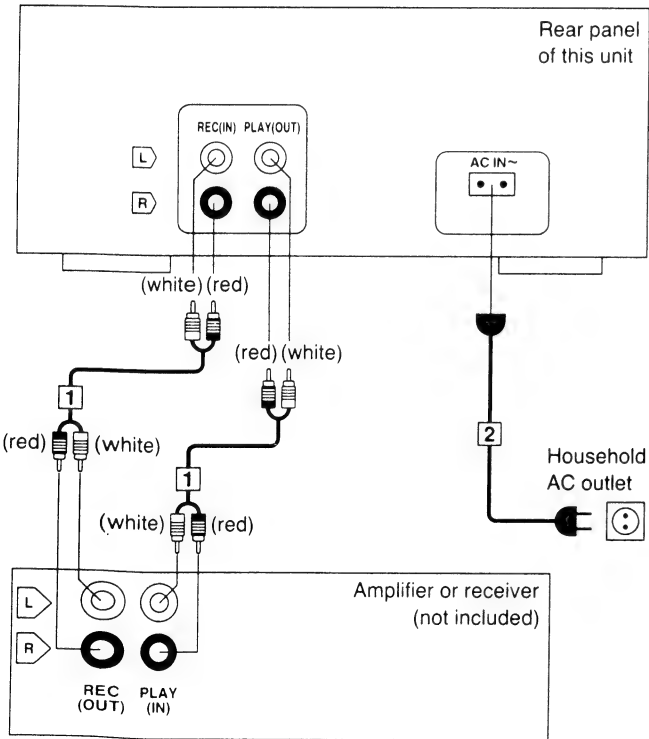


Stereo connection cables 2 pcs.
(SJP2276)



CONNECTIONS

Make connections in the numbered sequence by using the included cables.



The above illustration shows an example of connections made when this unit is combined with a Technics hi-fi component system, and shows only the connections to be made to and from this unit in that combination.

1 Connect the stereo connection cables.

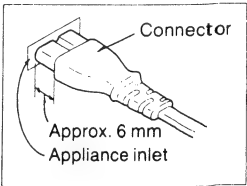
FOR UNITED KINGDOM ONLY
BE SURE TO READ THE CAUTION FOR AC POWER SUPPLY CORD ON PAGE 3 BEFORE PROCEEDING TO THE STEP 2.

2 Connect the AC power supply cord after you have connected all other cables and cords.

The configuration of the AC outlet and AC power supply cord differs according to area.

Insertion of Connector

Even when the connector is perfectly inserted, depending on the type of inlet used, the front part of the connector may jut out as shown in the drawing. However there is no problem using the unit.



Note:

Avoid letting the cables touch each other as much as possible, otherwise noise will be generated.

Placements hints

If this unit is placed near a receiver or a tuner, a "hum" noise may be heard during tape playback, recording, or AM reception of the receiver or the tuner. If this occurs, leave as much space as possible between the units, or place them where is the least amount of "hum".

■ CAUTION FOR AC MAINS LEAD

("EB" area code model only)

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.

A 5-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local dealer.

CAUTION!

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.

THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:


Blue: Neutral

Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

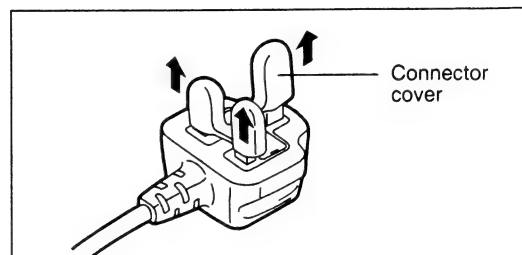
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol .

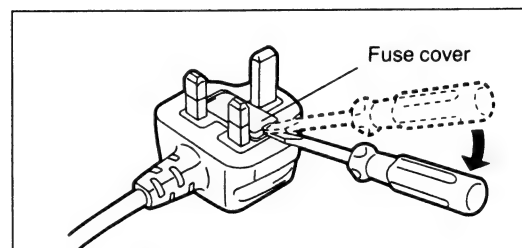
Before use

Remove the connector cover as follows.

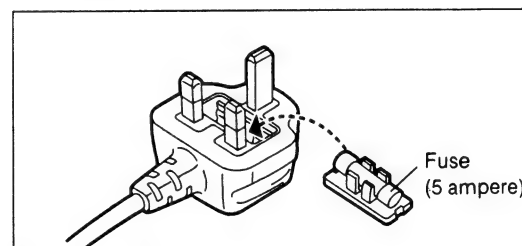


How to replace the fuse

1. Remove the fuse cover with a screwdriver.

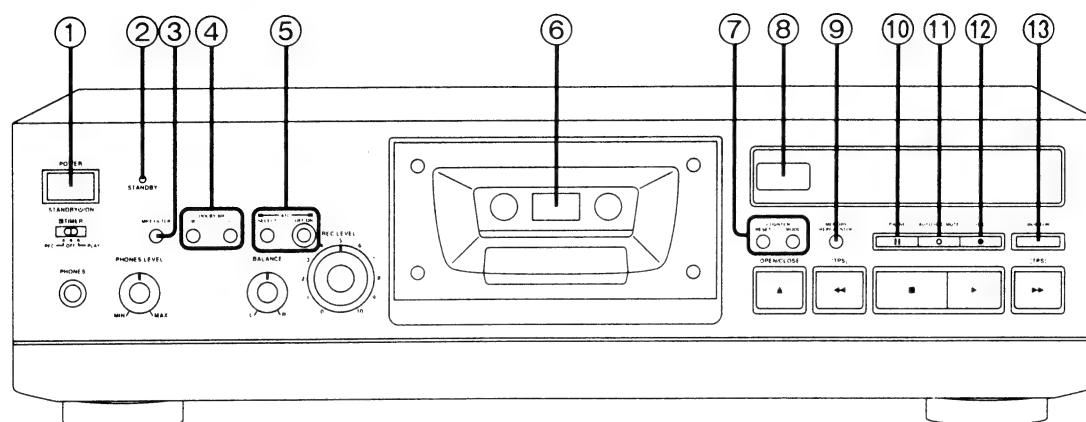


2. Replace the fuse and attach the fuse cover.



FRONT PANEL CONTROLS AND FUNCTIONS

Control section



① Power “STANDBY /ON” switch (POWER, STANDBY /ON)

Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.

② Standby indicator (STANDBY)

When the unit is connected to the AC mains supply, this indicator lights up in standby mode and goes out when the unit is turned on.

③ Multiplex filter button (MPX FILTER)

This prevents the Dolby NR circuit from operating in error when FM stereo broadcasts are recorded using the noise reduction function.

④ Dolby noise reduction buttons (DOLBY NR B, C)

These buttons are used to reduce the hissing noise heard from the tape. This unit is provided with both the B-type and C-type noise reduction systems. (See page 7.)

⑤ ATC buttons (ATC)

These buttons are used to set the most appropriate bias, level and equalizer according to the type of tapes.

SELECT: Each time the button is pressed, the bias position changes as follows:

Standard → High → Low

OFF/ON: This button is used to perform or to cancel ATC (Auto Tape Calibration).

⑥ Cassette holder

⑦ Tape counter buttons (COUNTER)

RESET: This button is used to reset the tape counter indication to “000_” or “00.00”.

MODE: This button is used to select the tape/linear counter indication.

⑧ Remote control signal sensor

You can operate this unit from the remote control equipped with Technics amplifier.

⑨ Memory button (MEMORY REPEAT/STOP)

This button is used to activate the memory repeat play and locate the designated point during playback or recording.

⑩ Pause button (II PAUSE)

This button is used to temporarily stop the tape playback or recording. (See page 7.)

⑪ Automatic record muting button (□ AUTO REC MUTE)

This button is used to make a silent interval on the tape while recording is in progress.

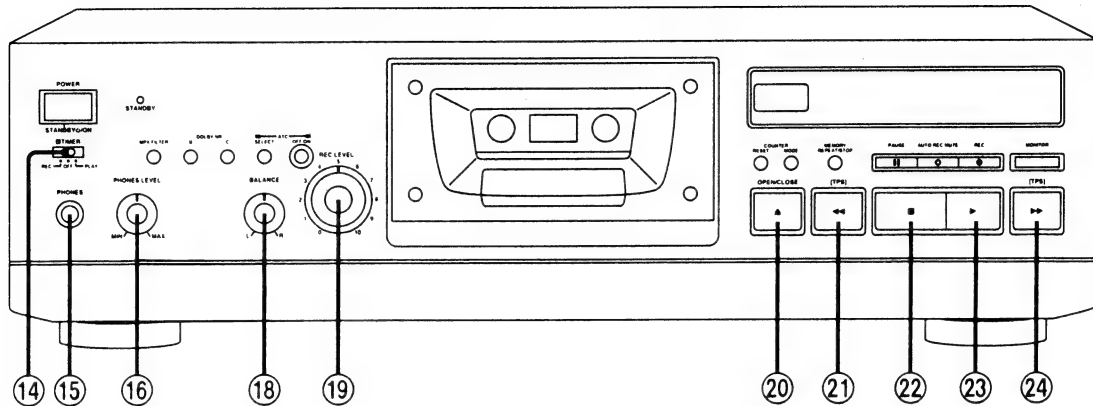
⑫ Record button (● REC)

This button is used to set deck to the recording standby mode.

⑬ Monitor button (MONITOR)

In order to check the recording condition, the sound being recorded and the sound from the sound source can be alternately selected by pressing this button. (The corresponding indicator will illuminate.)

Control section



⑭ Timer switch (⏏ TIMER)

This switch is used to automatically start a tape recording or begin tape playback at a certain time, selected by an optional timer.

⑮ Headphones jack (PHONES)

⑯ Headphones volume control (PHONES LEVEL)

(See page 7.)

⑰ Recording balance control (BALANCE)

This control is used to balance the left and right sound levels during recording.

⑱ Recording level control (REC LEVEL)

This control is used to regulate the recording level.

⑳ Cassette holder open/close button (▲ OPEN/CLOSE)

This button is used to open or close the cassette holder. (See page 7.)

㉑ Rewind/TPS button (◀◀ [TPS])

This button is used to rewind the tape or to easily and quickly search for the beginning of a tune.

㉒ Stop button (■)

This button is used to stop the tape movement.

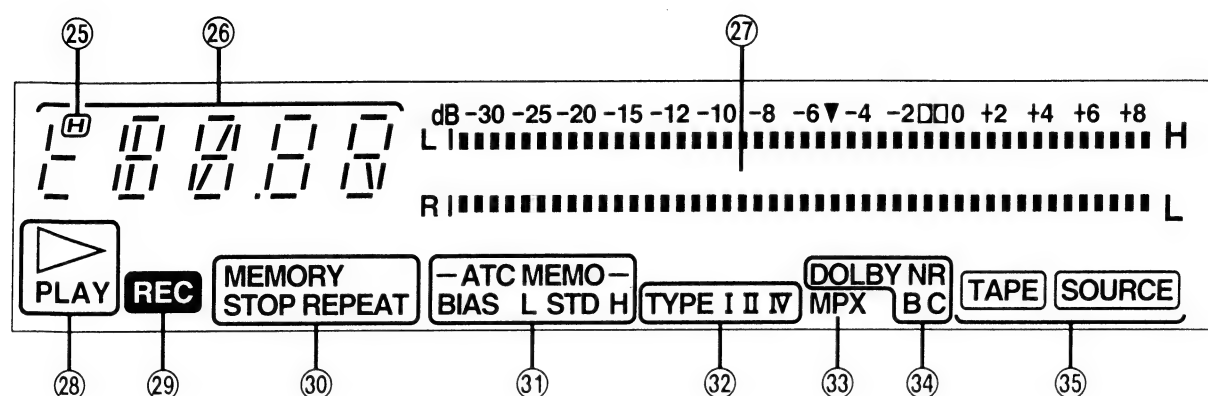
㉓ Playback button (▶)

This button is used to start the playback or recording. (See page 7.)

㉔ Fast forward/TPS button (▶▶ [TPS])

This button is used to advance the tape or to easily and quickly search for the beginning of a tune.

Display section



②⑤ High-speed rewind/fast-forward search indicator (H)

Illuminates during high-speed rewind/fast-forward or high speed search.

②⑥ Tape counter/ATC display

Normally functions as the tape/linear counter display. During ATC (Auto Tape Calibration), displays the present condition of the ATC operation.

②⑦ Level meter

Indicates the level of the recorded sound during playback.
Indicates the level being recorded, adjusted by the recording-level control.
Also displays the present condition of the ATC operation.

②⑧ Playback indicator (▷ PLAY)

Illuminates in the playback or the recording mode.
Flashes in the pause or recording standby mode.

②⑨ Recording indicator (REC)

Illuminates in the recording standby mode or recording mode.

③① Memory indicators (MEMORY STOP, MEMORY REPEAT)

Each indicator illuminates to show which of the memory modes was set by the memory button.

③① ATC memory indicator (ATC MEMO)

Indicates one of the programs of bias position as follows.
Flashes during ATC (auto tape calibration), and then remains illuminated when the ATC operation is completed.

BIAS STD: Standard
BIAS H: High
BIAS L: Low

③② Tape select indicators (TYPE)

The type of tape being used will be automatically detected and the indicator will illuminate.

I: NORMAL
II: CrO₂
IV: METAL

③③ MPX filter indicator (MPX)

Illuminates to indicate that the multiplex filter is on.

③④ Dolby noise-reduction indicators (DOLBY NR B, C)

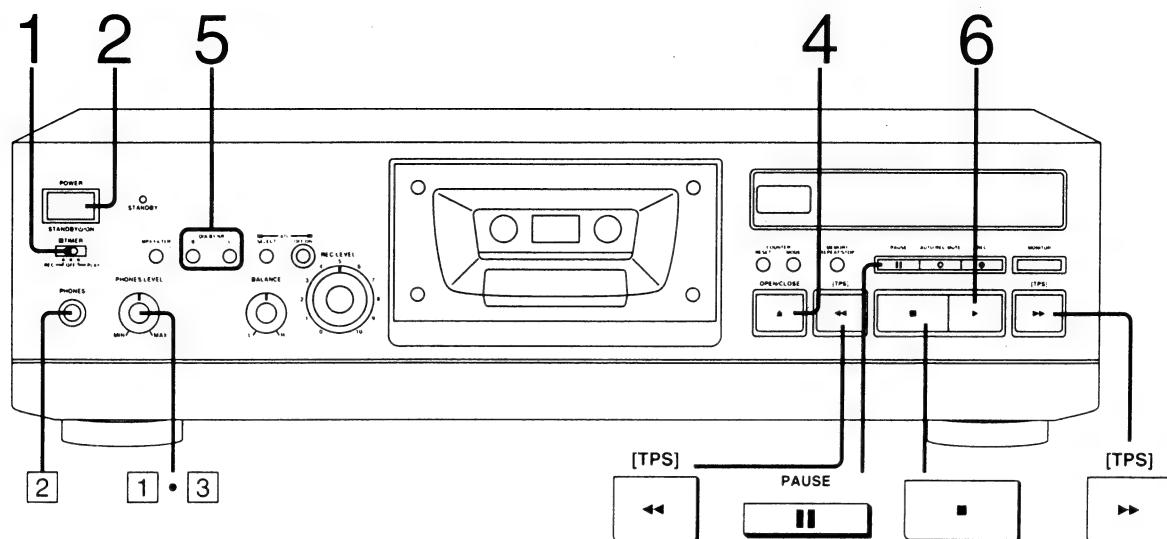
Indicator B or C illuminates when the corresponding noise reduction button (B or C) is pressed.

③⑤ Monitor indicators (TAPE, SOURCE)

Each indicator illuminates to show which sound is selected by the monitor switch.

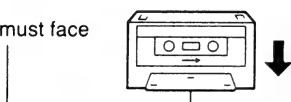
■ PLAYBACK (Basic play)

Either normal, CrO₂, or metal type cassettes can be used.



- 1 Set the timer switch to "OFF".
- 2 Press **POWER STANDBY/ON** to turn the unit on.
- 3 Select the "TAPE" input source on the amplifier.
- 4 Press **OPEN/CLOSE** and insert the cassette tape.

The exposed tape must face downward.



The cassette holder will automatically close.

This unit will automatically detect the type of tape being used, and then makes the suitable adjustments of the bias and equalization accordingly.

The tape select indicator will illuminate as follows:

TYPE I: NORMAL
TYPE II: CrO₂
TYPE IV: METAL

- 5 Press either **DOLBY NR B** or **C** to select the appropriate noise reduction system.

Set to off if neither of the Dolby noise-reduction systems is to be used.

To cancel Dolby noise reduction, press either B or C again. (DOLBY NR B or C indication will go out.)

- 6 Press the **playback button (▶)**.

The playback indicator will illuminate, and playback will begin.

■ To temporarily stop playback

Press **PAUSE**.

PAUSE

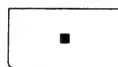


The playback indicator will begin flashing.

To resume playback, press **PAUSE** again or press the playback button.

■ To stop playback

Press the **stop button (■)**.

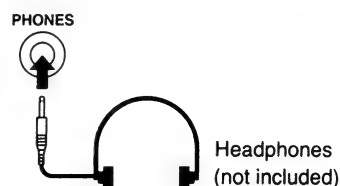


The playback indicator will go out.

■ Listening through headphones

- 1 Reduce the volume.
- 2 Connect the headphones (not included) to the headphones jack.

Plug type: 6,3 mm phone plug, stereo type.



- 3 Adjust the volume.

Turn to the right to increase or turn to the left to reduce.

Note:

Avoid listening for prolonged periods of time to prevent hearing damage.

DISASSEMBLY INSTRUCTIONS

“ATTENTION SERVICER”

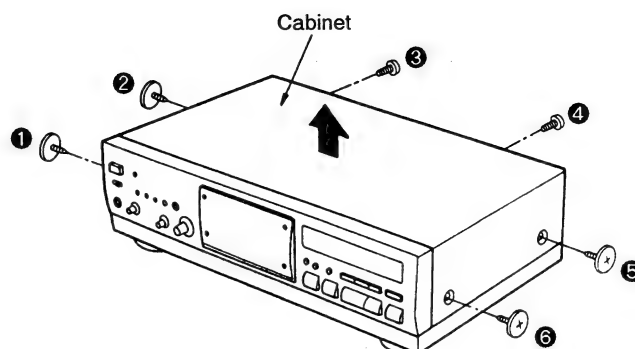
Some chassis components may have sharp edges. Be careful when disassembling and servicing.

Ref.No.
1

Removal of the cabinet

Procedure
1

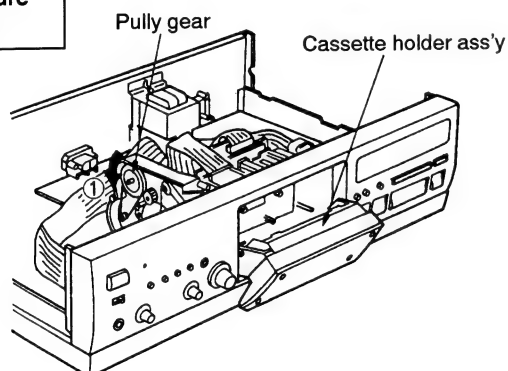
1. Remove the 6 screws (① ~ ⑥).
2. Remove the cabinet in the direction of arrow.



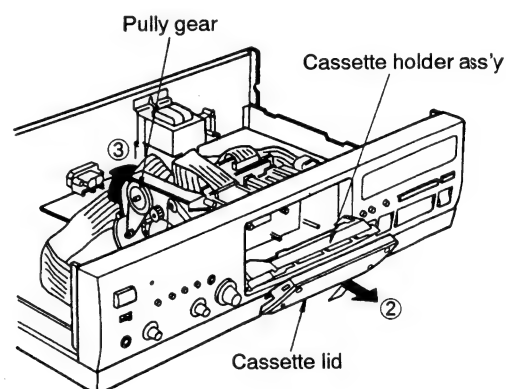
Ref.No.
2

Removal of the front panel ass'y

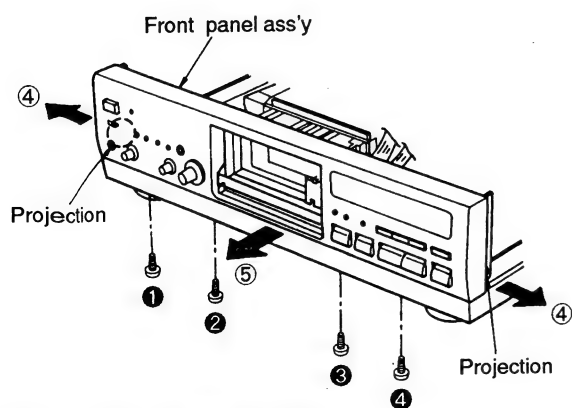
Procedure
1 → 2



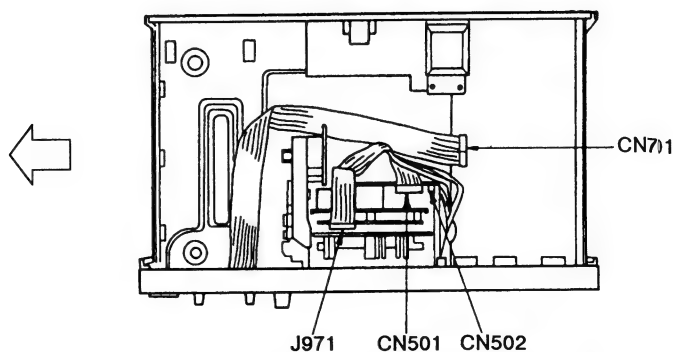
1. Turn the pulley gear in the direction of arrow ①, and open the cassette holder ass'y.



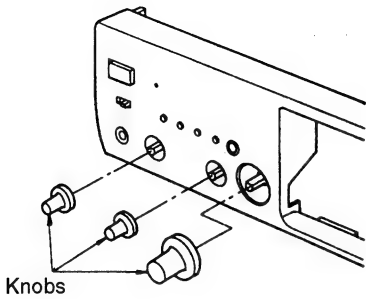
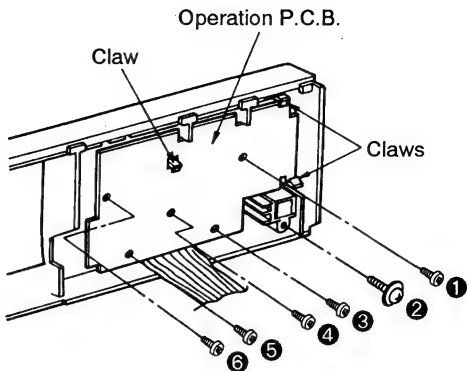
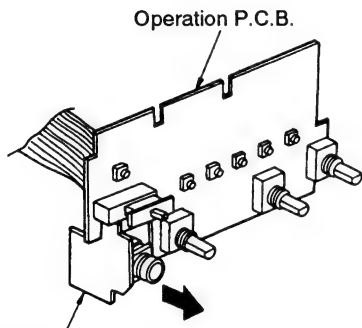
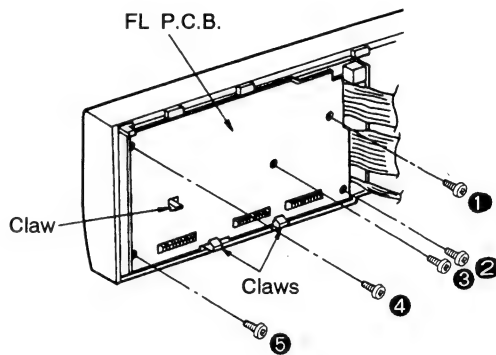
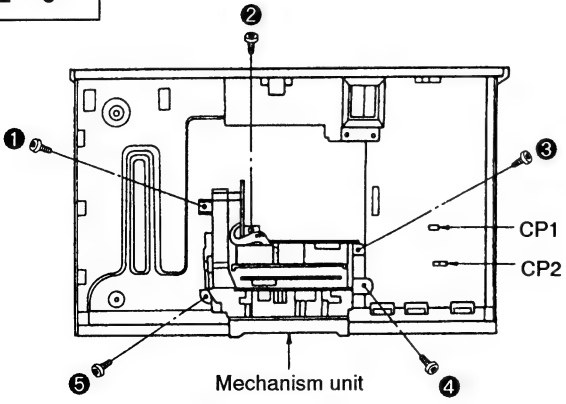
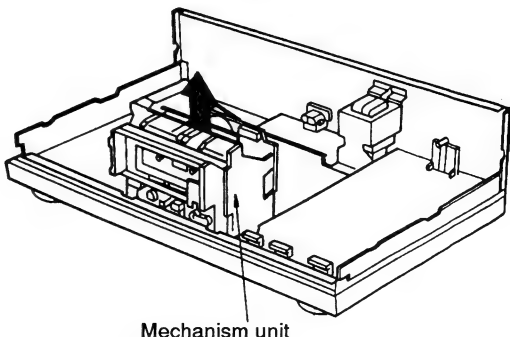
2. Remove the cassette lid in the direction of arrow ②.
3. Turn the pulley gear in the direction of arrow ③, and close the cassette holder ass'y.



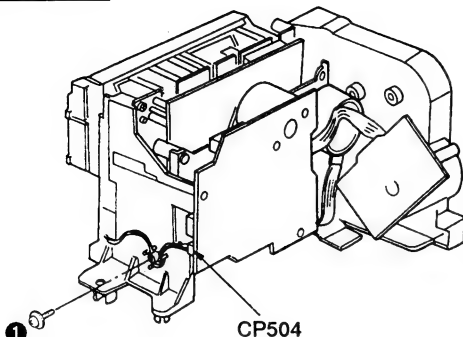
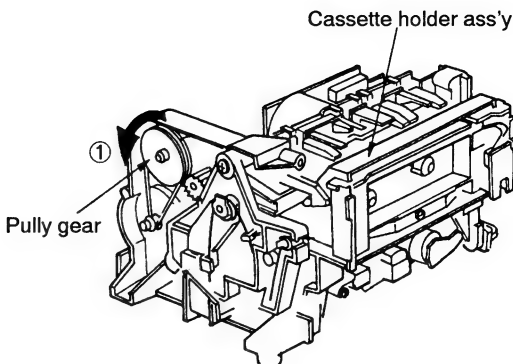
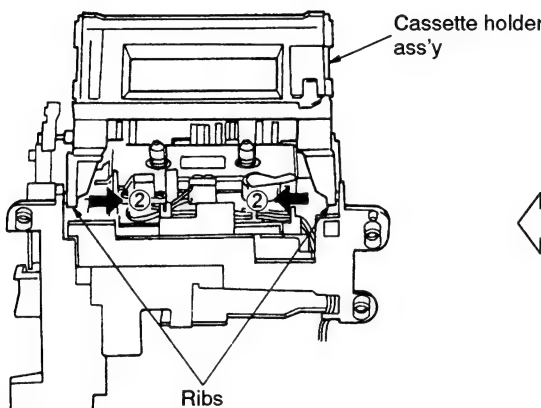
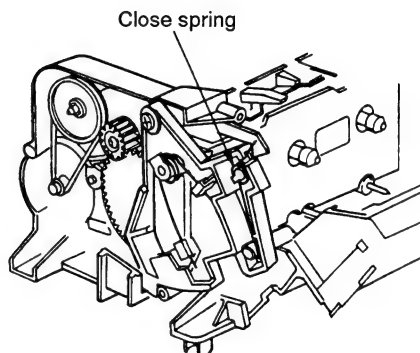
5. Remove the 4 screws (① ~ ④).
6. Pull the front panel ass'y in both directions of arrow ④ to unlock it from the projection of the chassis.
7. Remove the front panel ass'y in the direction of arrow ⑤.

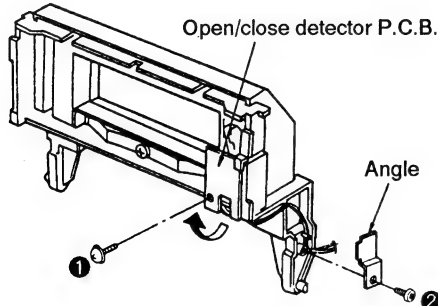
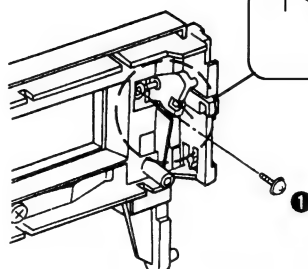


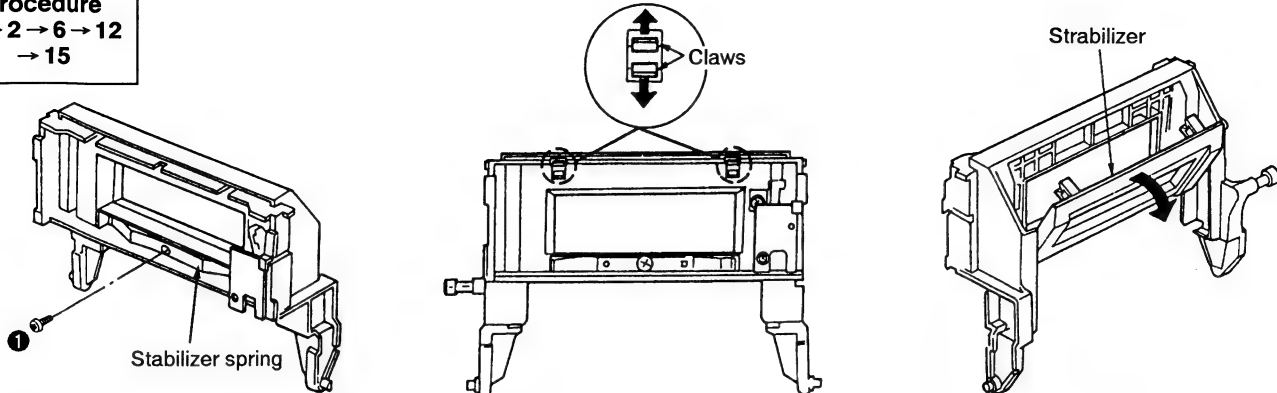
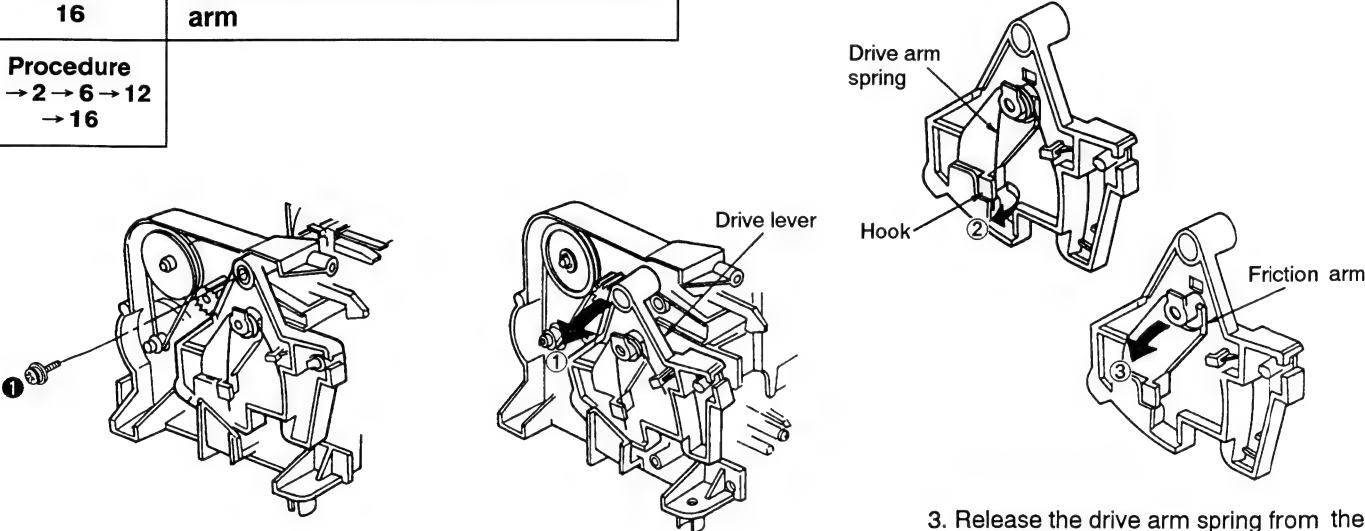
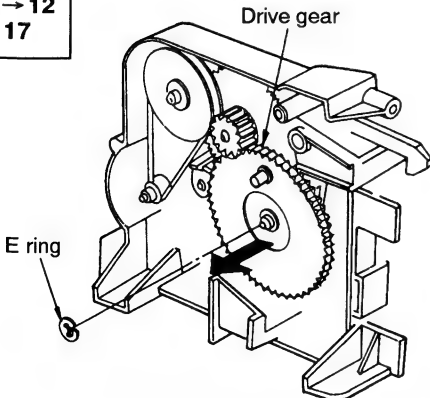
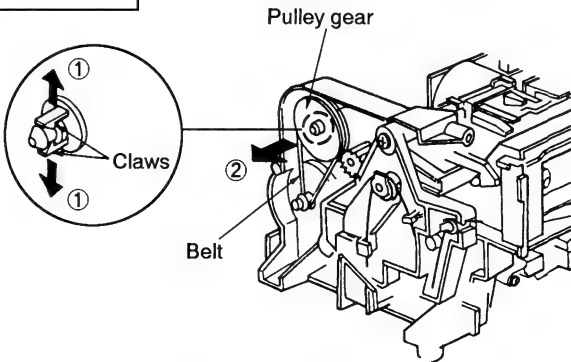
4. Remove the 4 connectors (CN501, CN502, CN701, J71).

Ref.No. 3	Removal of the operation P.C.B.		
Procedure 1→2→3			
<div><p>Knobs</p></div> <div><p>Operation P.C.B. Claw Claws</p></div> <div><div>1. Pull out the 3 knobs.</div><div>2. Remove the 6 screws(❶ ~ ❺).</div><div>3. Release the 3 claws.</div></div>			
Ref.No. 4	Removal of the headphones jack P.C.B.	Ref.No. 5	Removal of the FL P.C.B.
Procedure 1→2→3→4	Procedure 1→2→5		
<div><p>Operation P.C.B. Headphones jack P.C.B.</p></div> <div><ul style="list-style-type: none">Remove the headphones jack P.C.B. in the direction of arrow.</div>		<div><p>FL P.C.B. Claw Claws</p></div> <div><div>1. Remove the 5 screws(❶ ~ ❺).</div><div>2. Release the 3 claws.</div></div>	
Ref.No. 6	Removal of the mechanism unit		
Procedure 1→2→6			
<div><p>CP1 CP2 Mechanism unit</p></div> <div><p>Mechanism unit</p></div> <div><div>1. Remove the 2 connectors(CP1, CP2).</div><div>2. Remove the 5 screws(❶ ~ ❺).</div><div>3. Remove the mechanism unit in the direction of arrow.</div></div>			

Ref.No. 7	Removal of the power transformer	Ref.No. 8	Removal of the power supply P.C.B.
Procedure 1→7	<p>Power transformer</p> <ol style="list-style-type: none">1. Remove the 4 screws(❶~❹).2. Remove the power transformer in the direction of arrow.	Procedure 1→7→8	<p>Power supply P.C.B.</p> <p>Retention posts</p> <ol style="list-style-type: none">1. Remove the 1 screw(❶).2. Lift the power supply P.C.B. off the retention posts on the bottom chassis.
Ref.No. 9	Removal of the main P.C.B.	Ref.No. 10	Removal of the motor P.C.B.
Procedure 1→2→7→9	<p>Main P.C.B.</p> <p>CP1</p> <p>CP2</p> <ol style="list-style-type: none">1. Remove the 2 connectors(CP1, CP2).2. Remove the 4 screws(❶~❹).3. Remove the main P.C.B. in the direction of arrow.	Procedure 1→2→6→10	<p>Reel motor terminals(2 points)</p> <p>Capsan motor terminals(4 points)</p> <p>CP504</p> <p>Motor P.C.B.</p> <ol style="list-style-type: none">1. Remove the 1 connector(CP504).2. Unsolder the reel motor terminal.3. Unsolder the capstan motor terminals.4. Remove the 2 screws(❶, ❷).
Ref.No. 11	Removal of the loading motor ass'y		
Procedure 1→2→6→11	<p>Belt</p> <ol style="list-style-type: none">1. Remove the belt. <p>Loading motor ass'y</p> <ol style="list-style-type: none">2. Remove the 2 screws(❶, ❷).3. Remove the loading motor ass'y in the direction of arrow.		

Ref.No. 12	Removal of the cassette holder ass'y	
Procedure 1 → 2 → 6 → 12		
		
<p>1. Remove the 1 screw(❶).</p> <p>2. Remove the 1 connector(CP504).</p>		<p>3. Turn the pulley gear in the direction of arrow ❶, and open the cassette holder ass'y</p>
		
<p>5. Remove the ribs in the direction of arrow ❷.</p>		<p>4. Remove the close spring.</p>

Ref.No. 13	Removal of the open/close detector P.C.B.	Ref.No. 14	Removal of the detection lever
Procedure 1 → 2 → 6 → 12 → 13		Procedure 1 → 2 → 6 → 12 → 13 → 14	
			
<p>1. Remove the 2 screws(❶, ❷).</p> <p>2. Remove the angle.</p> <p>3. Remove the open/close detector P.C.B. in the direction of arrow.</p>		<p>1. Remove the 1 screw(❶).</p> <p>2. Remove the detection lever in the direction of arrow ❶, ❷.</p>	

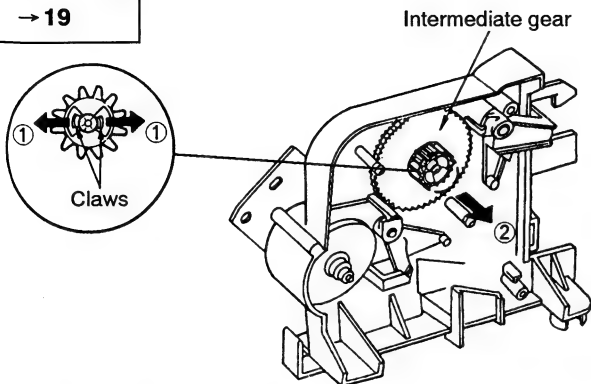
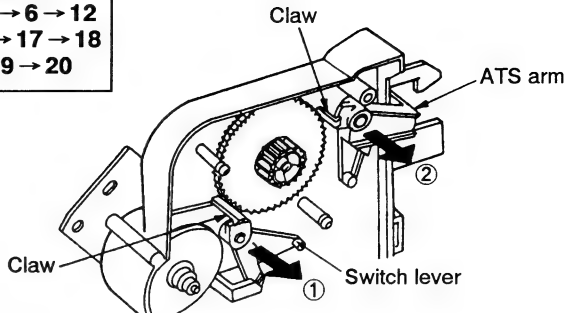
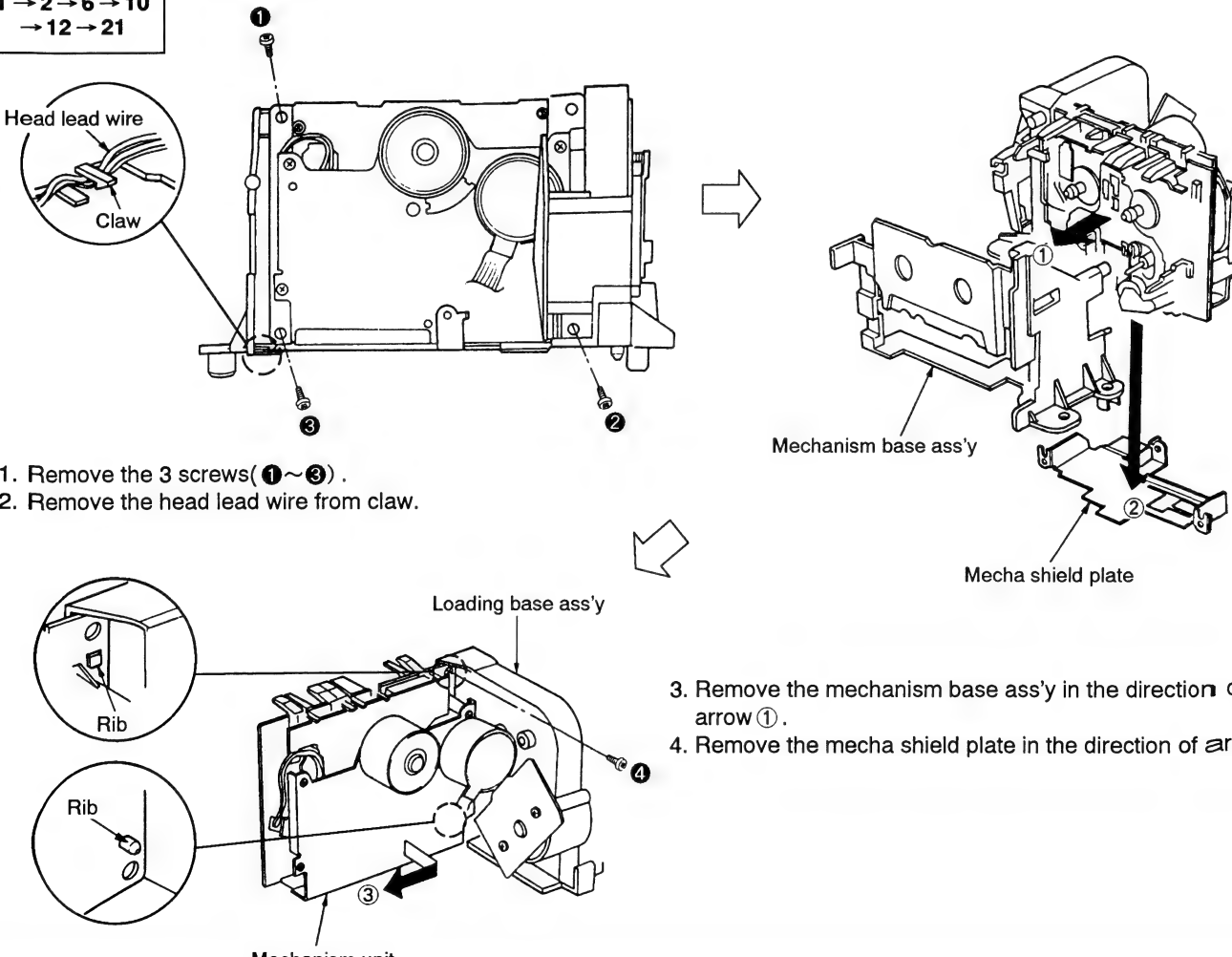
Ref.No. 15	Removal of the stabilizer		
Procedure 1 → 2 → 6 → 12 → 15			
<div>1. Remove the 1 screw(❶).</div> <div>2. Remove the stabilizer spring.</div> <div>3. Release the 4 claws.</div> <div>4. Remove the stabilizer in the dircetion of arrow.</div>			
Ref.No. 16	Removal of the drive lever and friction arm		
Procedure 1 → 2 → 6 → 12 → 16			
<div>1. Remove the 1 screw(❶).</div> <div>2. Remove the drive lever in the direction of arrow ❶ .</div> <div>3. Release the drive arm spring from the hook in the direction of arrow ❷ and remove the drive arm spring.</div> <div>4. Remove the friction arm in the direction of arrow ❸ .</div>			
Ref.No. 17	Removal of the drive gear	Ref.No. 18	Removal of the pulley gear
Procedure 1 → 2 → 6 → 12 → 16 → 17		Procedure 1 → 2 → 6 → 18	
<div>• Remove the E ring and then remove the drive gear in the direction of arrow.</div> <div>1. Remove the belt.</div> <div>2. Release the 2 claws in the direction of arrow ❶ .</div> <div>3. Remove the pulley gear in the direction of arrow ❷ .</div>			

1. Remove the 1 screw(❶).

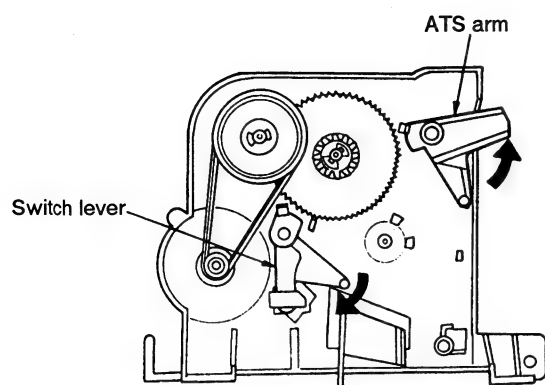
2. Remove the drive lever in the direction of arrow ❶ .

3. Release the drive arm spring from the hook in the direction of arrow ❷ and remove the drive arm spring.

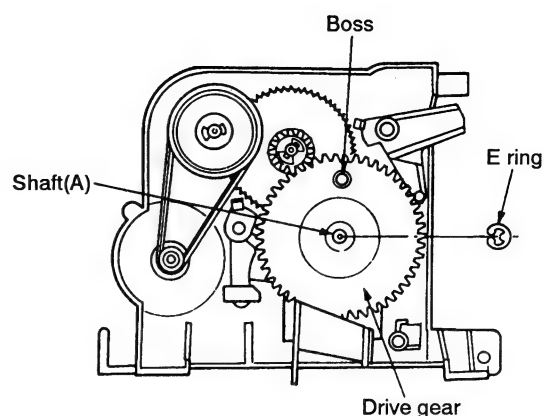
4. Remove the friction arm in the direction of arrow ❸ .

Ref.No. 19	Removal of the intermediate gear	Ref.No. 20	Removal of the switch lever and ATS arm
<p>Procedure 1 → 2 → 6 → 12 → 16 → 17 → 18 → 19</p>  <ol style="list-style-type: none"> 1. Release the 2 claws in the direction of arrow ①. 2. Remove the Intermediate gear in the direction of arrow ②. 		<p>Procedure 1 → 2 → 6 → 12 → 16 → 17 → 18 → 19 → 20</p>  <p>■ Removal of the switch lever</p> <ul style="list-style-type: none"> • Release the 1 claw and then remove the switch lever in the direction of arrow ①. <p>■ Removal of the ATS arm</p> <ul style="list-style-type: none"> • Release the 1 claw and then remove the ATS arm in the direction of arrow ②. 	
Ref.No. 21	Removal of the mechanism base ass'y, mecha shield plate, loading base ass'y and mechanism unit		
<p>Procedure 1 → 2 → 6 → 10 → 12 → 21</p>  <ol style="list-style-type: none"> 1. Remove the 3 screws (①~③). 2. Remove the head lead wire from claw. 3. Remove the mechanism base ass'y in the direction of arrow ①. 4. Remove the mecha shield plate in the direction of arrow ②. 5. Remove the 1 screw (④). 6. Remove the 2 ribs and then remove the mechanism unit in the direction of arrow ③. 			

■ INSTALLATION OF THE DRIVE GEAR

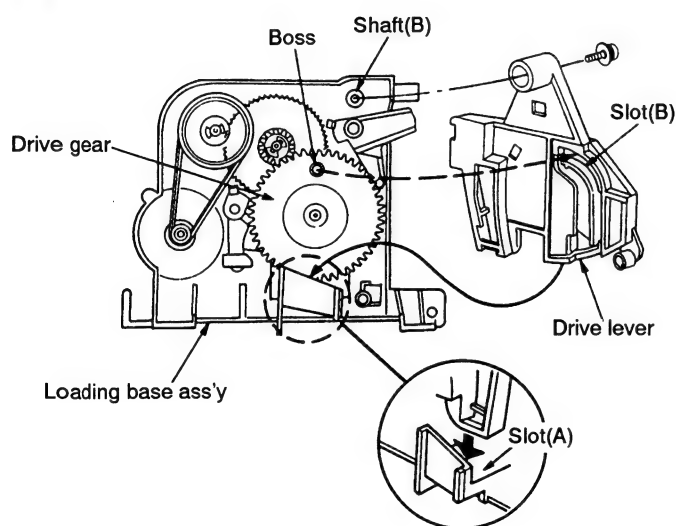


1. Rotate the ATS arm and switch lever fully in the direction of arrow.



2. Position the boss on the drive gear located to the top and attach the drive gear to the shaft(A).
3. Fix the E ring.

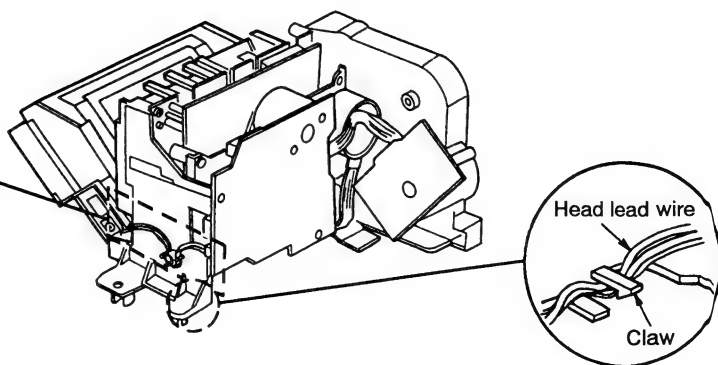
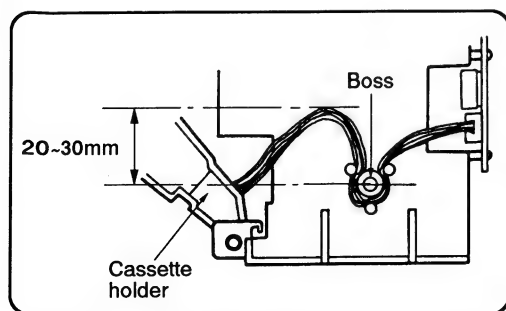
■ INSTALLATION OF THE DRIVE LEVER



1. Align the lower portion of drive lever with the slot(A) on the loading base ass'y.
2. Attach the drive lever to the shaft(B) and tighten the screw.

Note: When installing the drive lever to the loading base ass'y, align the boss on the drive gear with the slot(B) on the drive lever.

■ WIRE ARRANGEMENT



- Leave the cassette holder open and arrange the lead wire to provide 20 to 30mm slack between the cassette holder and boss.

- Pass the head lead wire through the claw as shown above.

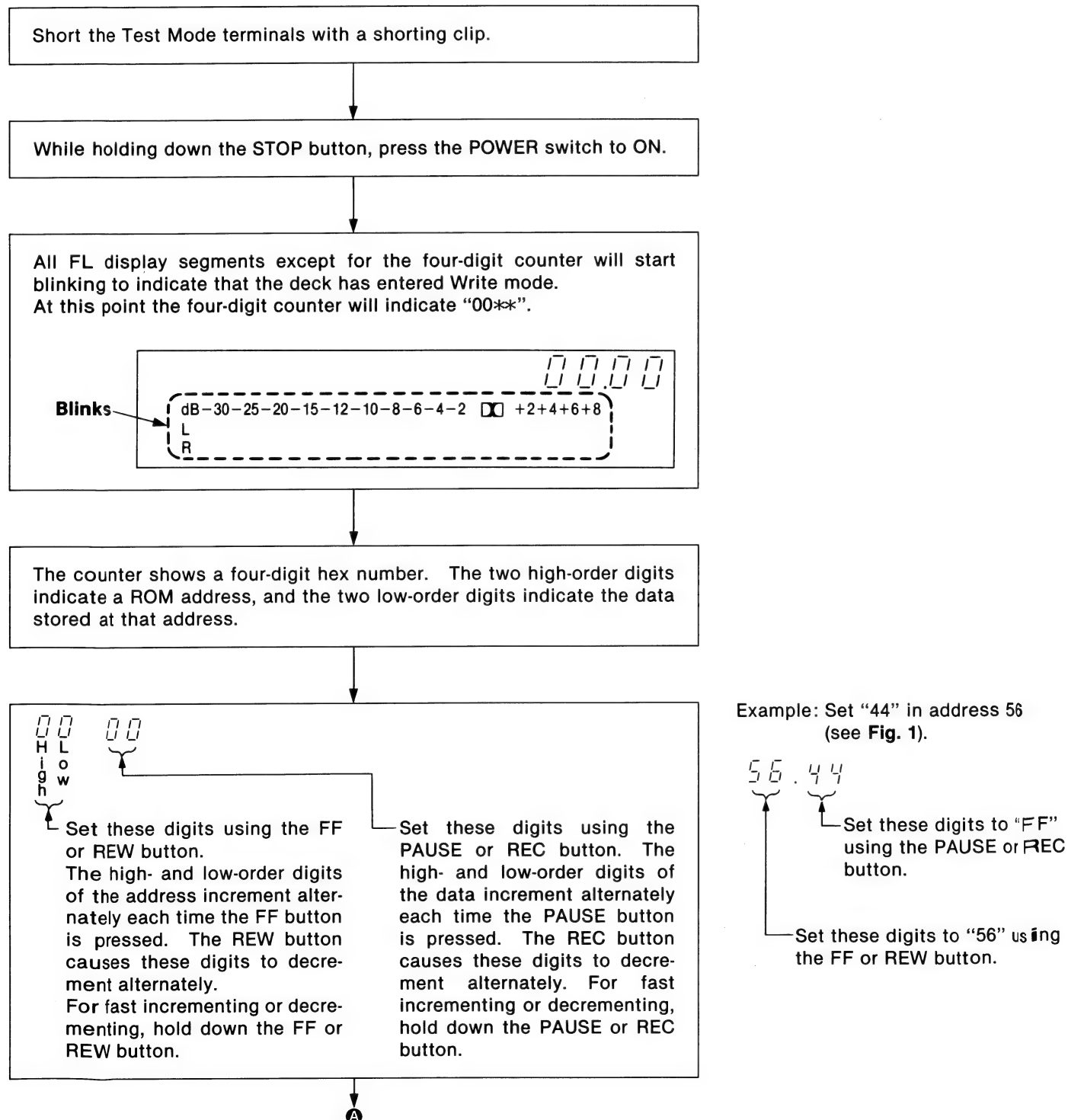
■ ADJUSTMENT PROCEDURE

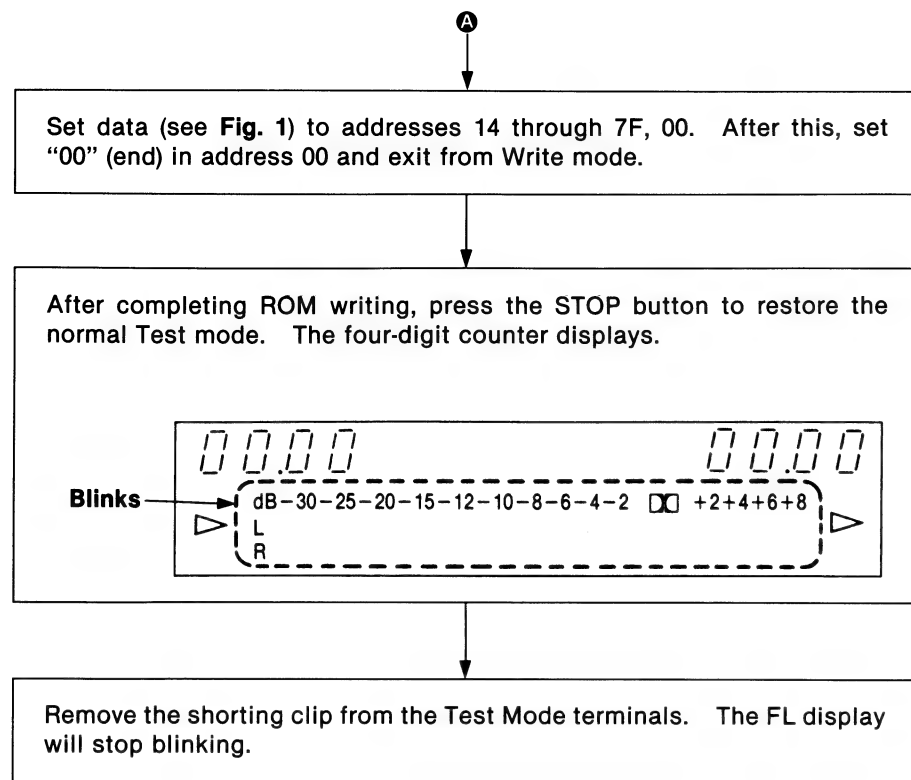
This unit holds recording bias and equalization data in its EEPROM chip. An internal CPU automatically adjusts playback gain, recording bias, overall gain, and overall frequency response according to the ROM data. Manual adjustment with potentiometers is no longer necessary except for head azimuth and tape speed. All other items require only measurement data checks.

The adjustment and checkout procedures are as follows.

• Writing to EEPROM

The EEPROM chip holds the optimal recording bias and equalization data. If the chip has been replaced, be sure to write to it, following the steps below:





• EEPROM MAP

Low \ High	0	1	2	3	4	5	6	7
0	00	—	60	8E	94	—	—	—
1	—	—	83	94	9A	—	—	—
2	—	—	34	1E	1A	—	—	—
3	—	—	6F	7F	8E	—	—	—
4	—	08	C0	BF	B8	60	8E	9D
5	—	20	7C	74	6F	83	98	9D
6	—	12	60	8E	9D	44	1E	1A
7	—	07	83	98	9D	64	6A	79
8	—	FB	44	1E	1A	C0	BF	BC
9	—	F5	5A	62	73	—	—	—
A	—	5E	C0	BF	BC	26	30	80
B	—	99	88	87	88	7C	7D	7D
C	—	50	8C	8C	94	70	6B	6B
D	—	7C	0F	0E	0D	83	83	83
E	—	4B	95	96	97	—	FF	01
F	—	51	0E	0D	0D	—	—	00

Fig. 1

■ MEASUREMENTS AND ADJUSTMENTS

Measurement Condition

- Recording level control; Maximum
- Timer switch; Off
- Recording balance control; Center
- Headphones volume control; Maximum

- Dolby NR switch; Off
- ATC switch; Off
- Make sure heads are clean
- Make sure capstan and pressure roller are clean
- Judgeable room temperature $20 \pm 5^\circ\text{C}$ ($68 \pm 9^\circ\text{F}$)

Measuring instrument

- EVM (Electronic Voltmeter)
- Oscilloscope
- Digital frequency counter
- AF oscillator

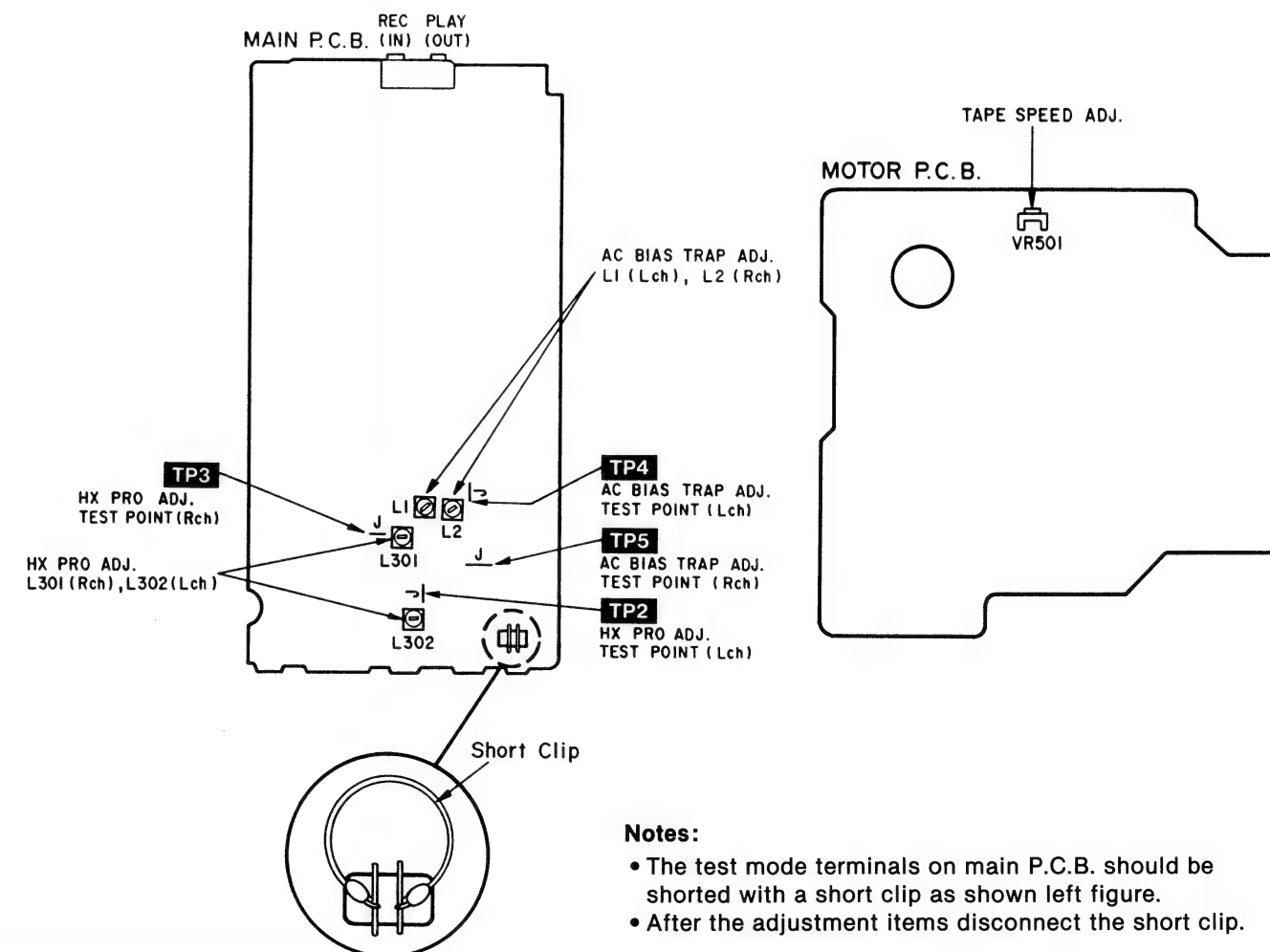
- ATT (Attenuator)
- DC voltmeter
- Resistor (600Ω)

Test tape

- Head azimuth adjustment (8kHz, -20dB); QZZCFM
- Tape speed adjustment (3kHz, -10dB); QZZCWAT
- Playback frequency response (315Hz, 12.5kHz, 10kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz, 63Hz, -20dB); QZZCFM
- Playback gain adjustment (315Hz, 0dB); QZZCFM

- Overall gain adjustment and Overall frequency response, AC bias trap adjustment and HX PRO adjustment. Normal reference blank tape; QZZCRA
- CrO₂ reference blank tape; QZZCRX
- Metal reference blank tape; QZZCRZ

• Adjustment Points



HEAD AZIMUTH

Caution:

- Please replace the heads and springs when reading the tape. Even if you replace the screws because of the screw and the screw.
- Please replace the heads when replacing the tape. If you wish to adhere the tape to the center of the tape.

1. Playback of the test tape until the center of the tape is reached.
2. Perform the head azimuth adjustment.
3. After the adjustment, the ing screw.

TAPE SPEED

Normal speed

1. Playback of the test tape.
2. Adjust VR501.

Adjustment

PLAYBACK

1. Set the AF adjustment.
2. With no REC button and Balance channels release the moment the tape is recorded. (At this point, the gains.) Adjust the output level.

Standard

AC BIAS TRAP

1. Insert the test tape to the Record Playback.
2. Adjust L1 between the minimum and maximum.

HX PRO ADJ.

1. Insert the test tape to the Record Playback.
2. Connect the test tape (R-CH) and the test tape (L-CH).
3. Adjust L3 to the minimum.

HEAD AZIMUTH ADJUSTMENT

Caution:

- Please replace both azimuth adjustment screws (QH1361A) and springs (QBC1278A) used for to new ones simultaneously when readjusting the head azimuth. (Shown in Fig. 2.) Even if you wish to readjust the head azimuth without replacing the screws and springs, a fine adjustment can not be done because of the screw-locking bond adhered to the azimuth screw and spring.
- Please remove the screw-locking bond left on the head base when replacing the azimuth screw.
- If you wish to readjust the head azimuth, be sure to adjust with adhering the cassette tape closely to the mechanism by pushing the center of cassette tape with your finger. (Shown in Fig. 3.)

1. Playback the azimuth adjustment portion (8kHz, -20dB) of the test tape (QZZCFM). Vary the azimuth adjusting screw until the output of the R-CH are maximized.
2. Perform the same adjustment in the play mode.
3. After the adjustment, apply screwlock to the azimuth adjusting screw.

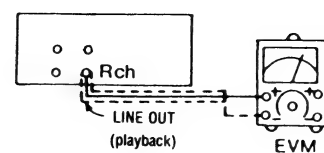


Fig. 1

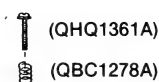


Fig. 2

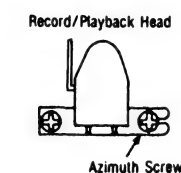


Fig. 4

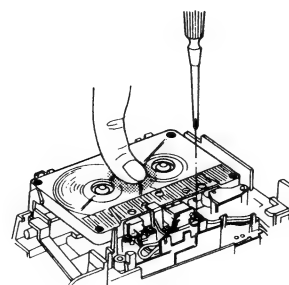


Fig. 3

TAPE SPEED ADJUSTMENT

Normal speed (Standard Value: ± 45 Hz)

1. Playback the middle portion of the test tape (QZZCWAT).
2. Adjust VR501 for the output value.

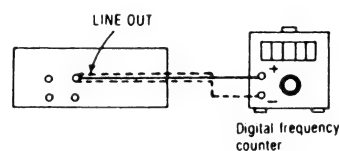
Adjustment target: ± 15 Hz

Fig. 5

PLAYBACK GAIN ADJUSTMENT

1. Set the AF oscillator's output frequency to 315Hz.
2. With no tape loaded in the deck, press and hold the REC button. Adjust the test signal level using the Rec. Level and Balance controls until the line output levels on both channels are 320mV. When the adjustment is complete, release the REC button. (The deck stores the data at the moment the REC button is released.)
3. Load the test tape (QZZCFM) into the deck and locate the part where the playback gain test tone (315Hz, 0dB) is recorded. Press the ATC button, then the PLAY button. (At this point the deck automatically adjusts the playback gains.) After this, play back the tape and verify that the output level falls in the specified range.

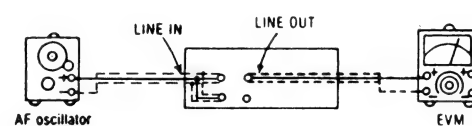
Standard value: $320\text{mV} \pm 0.5\text{dB}$ 

Fig. 6

AC BIAS TRAP ADJUSTMENT

1. Insert the Metal blank test tape (QZZCRZ) and set the unit to the Record mode.
2. Adjust L1 (L-CH) [[L2 (R-CH)]] so that the output voltage between TP4 (L-CH) [[TP5 (R-CH)]] and GND is less than the minimum value.

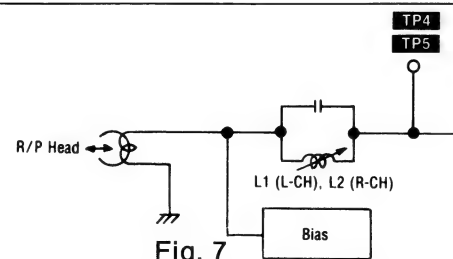


Fig. 7

HX PRO ADJUSTMENT

1. Insert the Metal blank tape (QZZCRZ) and set the unit to the Record Pause mode.
2. Connect a DC voltmeter across TP2 (L-CH) and GND, TP3 (R-CH) and GND.
3. Adjust L301 (L-CH) and L302 (R-CH) so that the output is the minimum value.

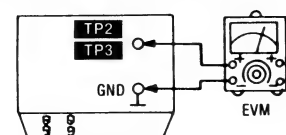


Fig. 8

PLAYBACK FREQUENCY RESPONSE

1. Playback the frequency response portion (315Hz, 12.5kHz~63Hz, -20dB) of the test tape (QZZCFM).
2. Assume that the frequency response is within the range shown in Fig. 10 for both L-CH and R-CH.

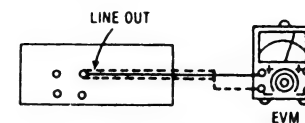


Fig. 9

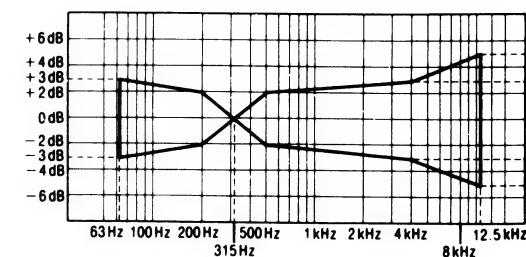


Fig. 10

ERASE CURRENT ADJUSTMENT

1. With no tape loaded in the deck, press the Record button.
2. Check if the output at this time between the erase current confirmation point TP1 and GND (chassis) is within the standard value.

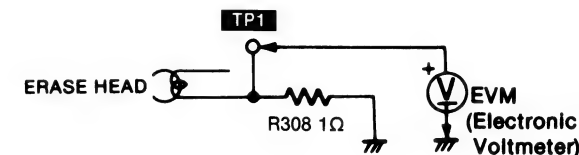
Standard value: $190 \pm 20\text{mA}$ (Metal)...EVM Reading: $190 \pm 20\text{mV}$ 

Fig. 11

OVERALL GAIN ADJUSTMENT AND OVERALL FREQUENCY RESPONSE

1. Load a Normal blank test tape (QZZCRA) into the deck under test. Press the ATC button, then the REC button. (At this point the deck automatically adjusts the overall gain and frequency response.)
2. With the deck placed in Record. Pause mode, apply the reference test signal (1kHz) to the Rec. input and adjust the output level to 320mV with the attenuator (ATT). After this, start recording.
3. While playing back the reference signal just recorded, verify that the output level falls in the following range.

Standard value: $320\text{mV} \pm 0.5\text{dB}$

4. Apply test signals (with the specified test frequencies covering the range from 50Hz to 10kHz) whose levels are 20dB lower than the reference signal level (1kHz) to the Rec. input and record these signals in sequence.
 5. Play back the test signals just recorded and verify that the levels at the test frequencies fall in the ranges specified in Fig. 13 with respect to the reference signal level.
 6. Repeat steps 4 and 5 above for CrO₂ blank test tape (QZZCRX) and Metal blank test tape (QZZCRZ), in these cases raising the upper end of the test signal frequency range to 12.5kHz. Verify that the signal levels at the test frequencies fall in the ranges specified in Fig. 14 with respect to the reference signal level.
- Steps 1 through 3 above are concerned with overall gain; steps 4 through 6 pertain to overall frequency response.

Normal Overall frequency response chart (NR OUT)

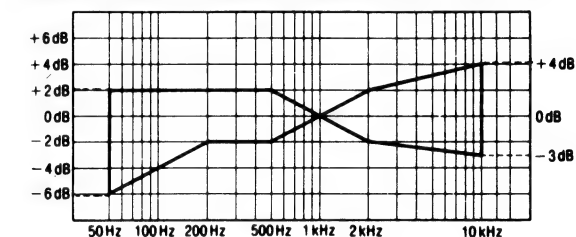


Fig. 13

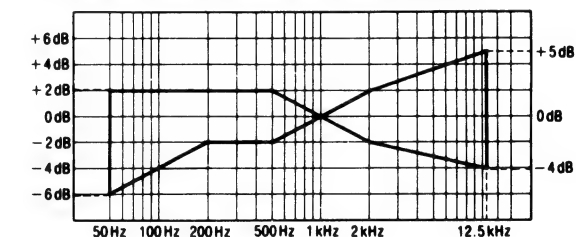
CrO₂ Metal Overall frequency response chart (NR OUT)

Fig. 14

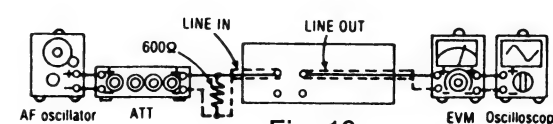
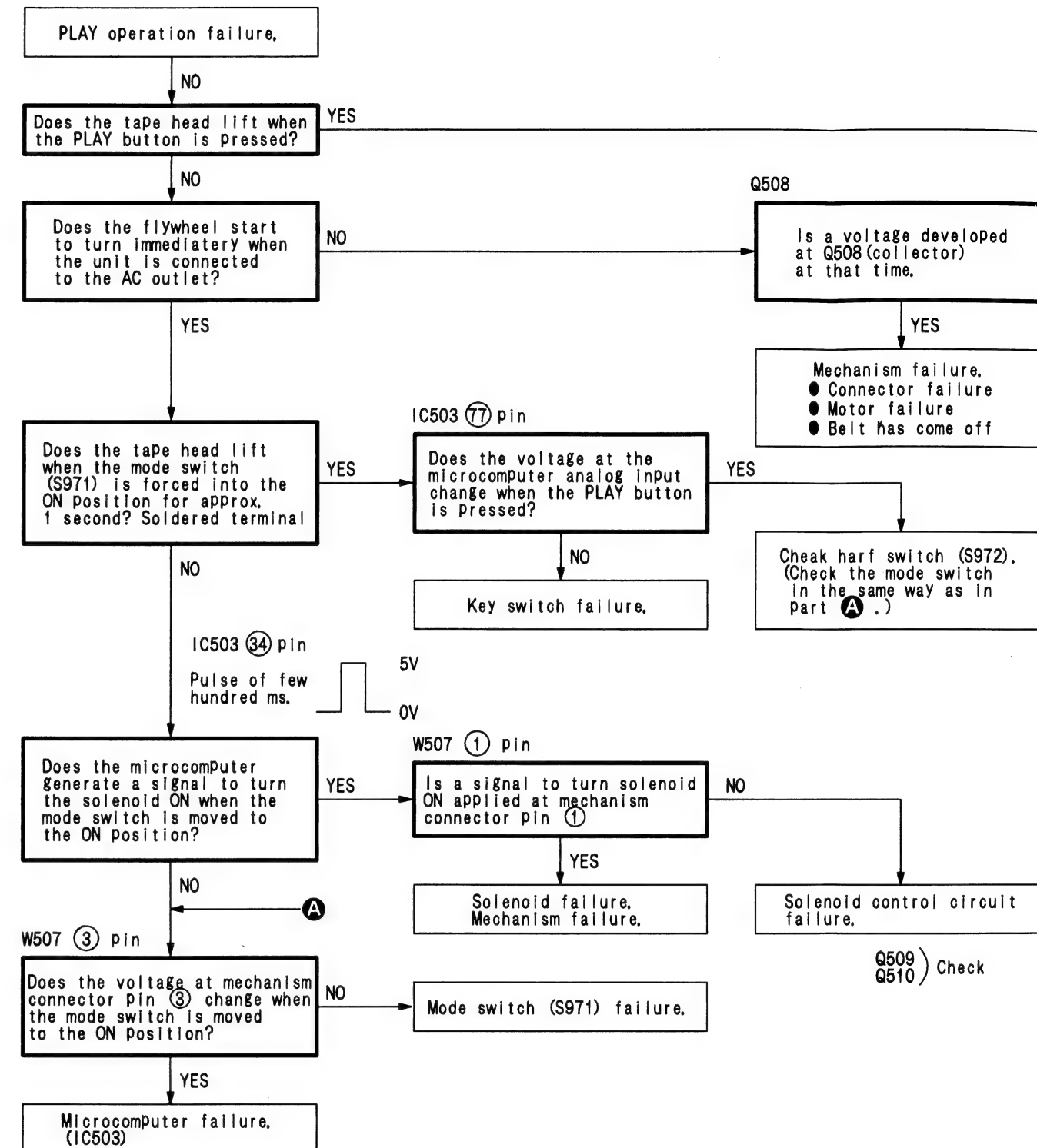
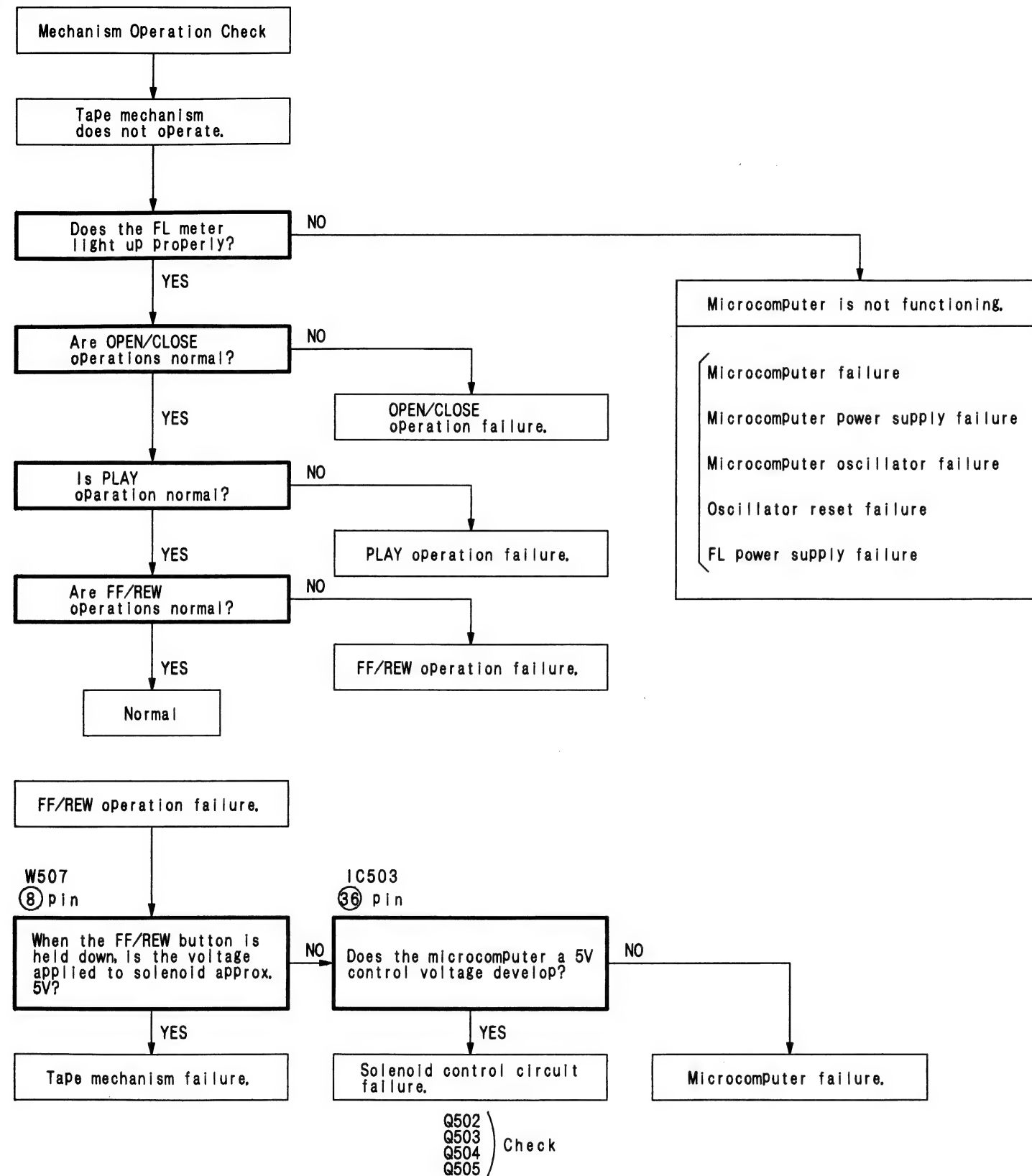
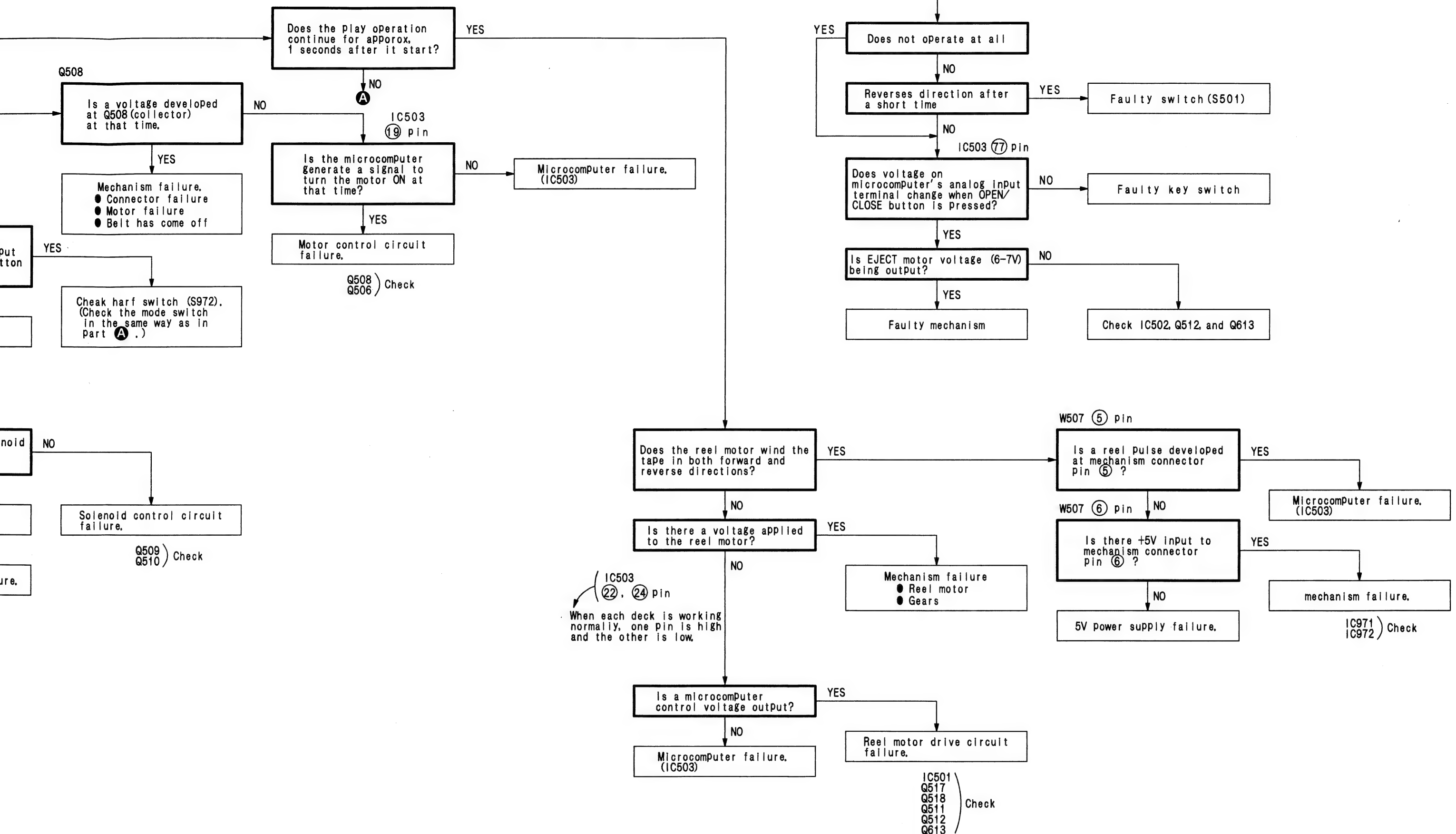


Fig. 12

TROUBLESHOOTING GUIDE



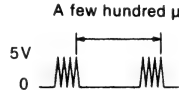
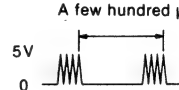
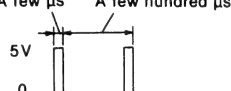
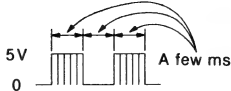


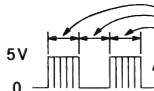
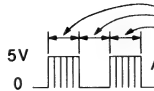
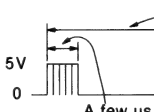


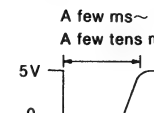




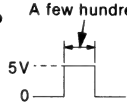
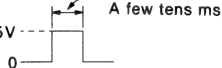
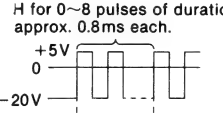
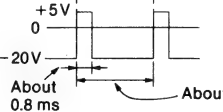
■ TERMINAL FUNCTION OF IC

• IC503 (M38172M2500F): MICROCOMPUTER

* To check the contents of the item “※” in the IC terminal table, set the unit to the state described in the “Motor Control PCB Checking Method” on page 15.

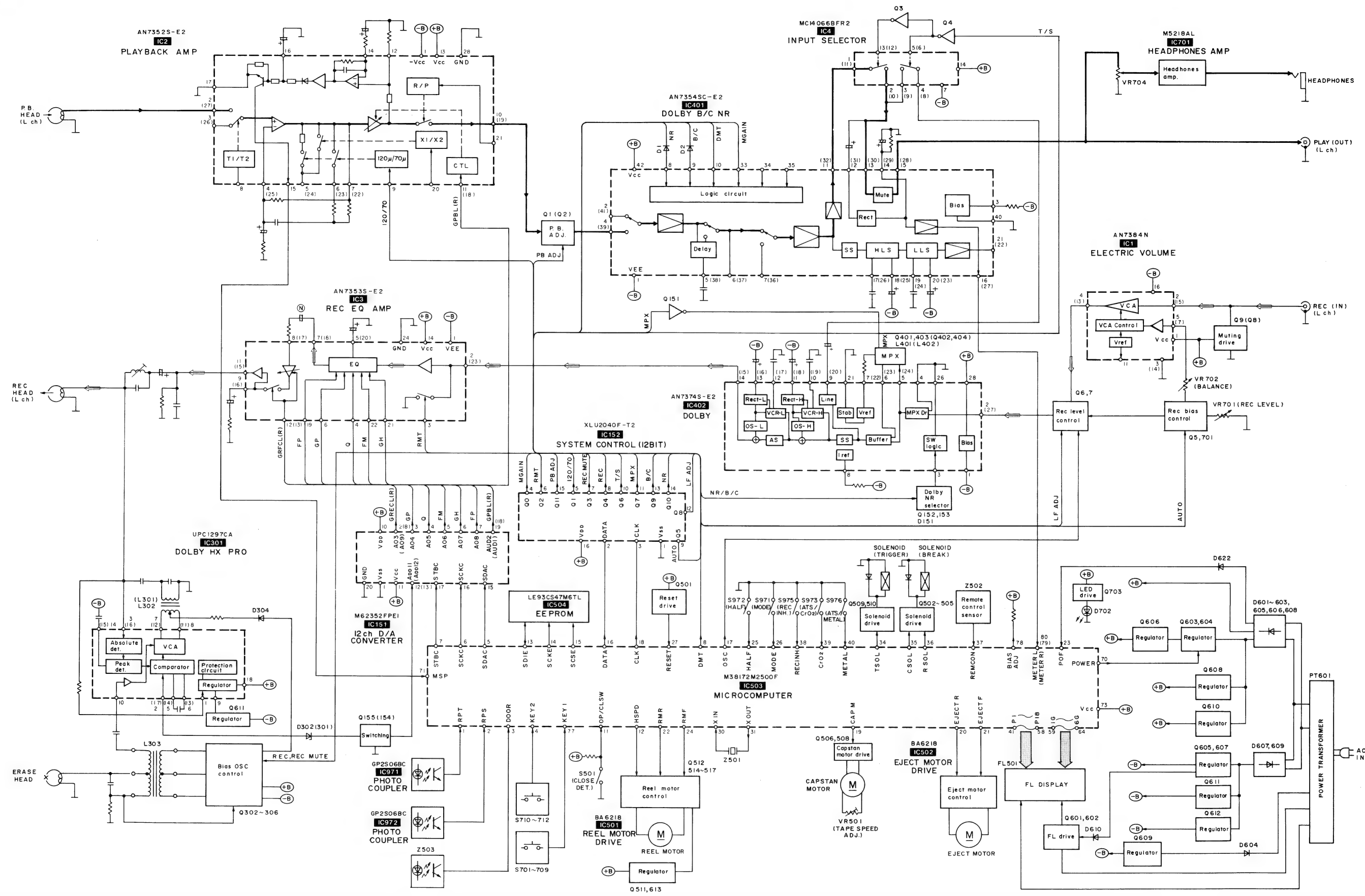
Pin No.	Mark	I/O Division	Function	Check point	※ Discription
1	RPT	I	Reel pulse det. input (take up side)	Connector W507 ⑤ pin	 <p>Changes within the 0 ↔ 3V range each time the take up reel is through approximately 30 degrees.</p>
2	RPS	I	Reel pulse det. input (supply side)	Connector W507 ⑪ pin	 <p>Changes within the 0 ↔ 3V range each time the take up reel is through approximately 30 degrees.</p>
3	DOOR	I	Cassette holder half det. input (photo det.)	Connector W501 ⑧ pin	Tape in: 5V Tape out: 0V
4	KEY2	I	Key switch (COUNTER RESET, COUNTER MODE, MEMORY REPEAT/STOP, POWER, DOLBY B, DOLBY C, MPX, ATC ON/OFF, ATC SELECT, TIMER REC/PLAY) input	Connector IC503 ④ pin	+5V without key input and 0V with the stop key ON. An analog value (0~5V) is used for each key ON.
5	SDAC	O	DA converter data output ON: “L”, OFF: “H”	Connector CP3 ④ pin	 <p>Usually</p>
6	SCKC	O	DA converter serial clock output ON: “L”, OFF: “H”	Connector CP3 ③ pin	 <p>Usually</p>
7	STBC	O	DA converter strove signal output ON: “H”, OFF: “L”	Connector CP3 ② pin	 <p>Usually</p>
8	DMT	O	Line out mute signal output ON: “L”, OFF: “H”	Connector CP3 ① pin	“L” (=0V) when sound is being produced in the play or REC mode and “H” (=5V) when no sound is produced in the stop or FF/REW mode.
9	$\overline{\text{CS}}$	—	Not used	—	Connected to GND
10	CLK1				
11	OP/CL SW	I	Can switch of eject mechanism input	Connector W501 ③ pin	Cassette holder open/close condition: 0V Cassette holder active: 5V
12	HSPD	O	High speed take up selector output of reel motor	Connector W501 ② pin	“H” (=5V) when deck is in the high-speed FF/REW or TPS mode and “L” (=0V) in other modes.
13	SDIK	I/O	E2PROM chip select signal (ON: “H”, OFF: “L”)	Connector CN503 ⑤ pin	 <p>(ex...PLAY ↔ STOP mode is changed)</p>

Pin No.	Mark	I/O Division	Function	Check point	※ Discription
14	SCKE	O	E2PROM serial clock signal output ON: "H", OFF: "L"	Connector CN503 ④ pin	 (ex...PLAY ↔ STOP mode is changed)
15	SCSE	O	E2PROM serial data signal output ON: "H", OFF: "L"	Connector CN503 ③ pin	 (ex...PLAY ↔ STOP mode is changed)
16	DATA	O	Serial data for amp control output ON: "H", OFF: "L"	Connector CP3 ⑧ pin	 Usually
17	OSC	O	Audio signal for adjustment output ON: "H", OFF: "L"	Connector CP3 ⑦ pin	Generates signals at approx. 400Hz or 10kHz (square wave (H and L, 0 and 5V) in REC mode during adjustment of ATC).
18	CLK	O	Serial clock for serial data output	Connector CP3 ⑥ pin	 Data output in response to serial data
19	CAPM	O	Capstan motor ON/OFF control output ON: "H", OFF: "L"	Connector W502 ③ pin	STOP mode: "L" (=0V) PLAY mode: "H" (=5V)
20	EJECT R	O	Eject motor close control output	Connector W501 ⑤ pin	OPEN → CLOSE mode: "H" (=5V) Other mode: "L" (=0V)
21	EJECT F	O	Eject motor open control output	Connector W501 ④ pin	CLOSE → OPEN mode: "H" (=5V) Other mode: "L" (=0V)
22	RMR	O	Reel motor reverse output	Connector W501 ⑥ pin	REW mode: "L" (=0V) Other mode: "H" (=5V)
23	POF	I	Power off det. input ON: "H", OFF: "L"	Connector CP4 ⑤ pin	 Rectified waveform at both 50 and 60 Hz (clamping at 5V)
24	RMF	O	Reel motor forward output	Connector W501 ⑦ pin	PLAY/FF mode: "L" (=0V) Other mode: "H" (=5V)
25	HALF	I	Cassette half det. switch input	Connector W507 ② pin	Tape in close mode: "L" (=0V) Other mode: "H" (=5V)
26	MODE	I	Mechanism mode switch det. input	Connector W507 ③ pin	STOP/FF/REW mode: "H" (=5V) PLAY/TPS mode: "L" (=0V)
27	RESET	I	Reset input ON: "L", OFF: "H"	TRANSISTOR Q501 collector	 Usually H (=5V) but L for a period of a few to a few tens of milliseconds is first plugged in when the player
28	XCIN	—	Not used	—	—
29	XCOU	—	Not used	—	—

Pin No.	Mark	I/O Division	Function	Check point	※ Discription
30	XIN	I	Microcomputer clock OSC terminal	Z501 ① pin terminal	 Oscillator waveform at 6MHz
31	XOUT	O	Microcomputer clock OSC terminal	Z501 ③ pin terminal	 Oscillator waveform at 6MHz
32	V _{SS}	—	Microcomputer GND	Connector CP5 ⑩ pin	0V
33	RMSP	O	Trigger solenoid control output	Connector W507 ① pin	STOP → PLAY or PLAY → STOP mode  A few hundred ms
34	T SOL	O	Reel motor speed control output	D504 ④ terminal	FF/REW mode: "H" (=5V) PLAY mode: "L" (=0V)
35	CSOL	O	Brake solenoid hold control output	IC503 ⑤ pin	FF/REW/TPS mode: "H" (=5V) Other mode: "L" (=0V)
36	BSOL	O	Brake solenoid control output	Q503 ⑥ terminal	STOP → FF/REW or PLAY → TPS mode  A few tens ms
37	REMOCON	I	Remocon signal input ON: "H", OFF: "L"	Z502 ① pin	H and L pulse waveform appears on the input of a remote control signal.
38	RECINH	I	Rec inhibit switch input	Connector W507 ⑦ pin	Rec OK: "L" (=0V) Rec NG: "H" (=5V)
39	CrO ₂	I	CrO ₂ tape det. input	Connector W507 ⑨ pin	CrO ₂ /Metal or no tape: "H" (=5V) Normal tape: "L" (=0V)
40	METAL	I	Metal tape det. input	Connector W507 ⑩ pin	Metal or no tape: "H" (=5V) Normal or CrO ₂ tape: "L" (=0V)
41 } 58	P1 } P18	O	FL meter segment output ON: "H", OFF: "L"	FL501 ⑬~⑮ pin	 H for 0~8 pulses of duration approx. 0.8ms each. P1~P18  About 0.8 ms About 4ms. 1G~6G
59 } 64	1G } 6G	O	FL meter glid output ON: "H", OFF: "L"	FL501 ⑪~⑬ pin	
65 } 69	7G } 11G	—	Not used	—	—
70	POWER	O	Power control output ON: "H", OFF: "L"	Connector CP3 ⑩ pin	Power ON: "H" (=5V) Power OFF: "L" (=0V)
71	MSP	I	TPS signal det. input ON: "L", OFF: "H"	Connector CP3 ⑨ pin	TPS mode No program: "H" (=5V) Programs: "L" (=0V)

Pin No.	Mark	I/O Division	Function	Check point	※ Discription
72	TEST	—	Test mode input	Connector CP3 ⑧ pin	Normal: "H" (=5V) Test (Service) mode: "L" (=0V)
73	V _{CC}	I	Power supply terminal	Connector CP4 ⑨ pin	+5V
74	V _{EE}	I	FL meter pull down voltage input terminal	Connector CP5 ⑥ pin	−20V
75	AV _{SS}	—	GND terminal (A/D)	Connector CP5 ⑩ pin	0V
76	VREF	I	Reference power supply (+5V) (A/D)	Connector CP5 ⑧ pin	+5V
77	KEY1	I	Key switch (STOP, FF, MONITOR, REW, PLAY, REC, ARM, PAUSE, OPEN/CLOSE) input	IC503 ⑦ pin	+5V without key input on deck 1 and 0V with the stop key ON. An analog value (0~5V) is used for each key ON.
78	BIAS ADJ	O	Bias adj. V.R terminal	Connector CP3 ⑤ pin	Bias ADJ. Vol. min 0V center About 2.5V max About 5V
79	METER R	I	Rch meter level input	Connector CP3 ⑥ pin	Source mode: No signal (About 0V): 0V 0VU (−20dB) input: About 1V Canges within 0 ↔ 5V range each input level mode.
80	METER L	I	Lch meter level input	Connector CP3 ⑦ pin	

BLOCK DIAGRAM



- Notes:
- → Playback signal
 - → Recording signal

SCHEMATIC DIAGRAM (Parts list on pages 51~54.)

(This schematic diagram may be modified at any time with the development of new technology.)

Note:

- S501 : Close switch (Loading).
- S701 : Stop switch (■).
- S702 : Fast forward/TPS switch (▶▶ [TPS]).
- S703 : Monitor switch.
- S704 : Rewind/TPS switch (◀◀ [TPS]).
- S705 : Playback switch (▶).
- S706 : Record switch (● REC).
- S707 : Automatic record muting switch (● AUTO REC MUTE).
- S708 : Pause switch (■ PAUSE).
- S709 : Cassette holder open/close switch (▲ OPEN/CLOSE).
- S710 : Tape counter switch.
711 (S710: RESET, S711: MODE)
- S712 : Memory switch (MEMORY REPEAT/STOP).
- S713 : Power "STANDBY ◊ /ON" switch (POWER, STANDBY ◊ /ON).
- S714 : Multiplex filter switch (MPX FILTER).
- S715 : Dolby noise reduction switches.
716 (S715: DOLBY NR B, S716: DOLBY NR C)
- S717 : ATC switch (ATC).
718 (S717: OFF/ON (Auto Tape Calibration), S718: SELECT (Standard → High → Low).)
- S719 : Timer switch (□ TIMER).
- S971 : Mode switch in "off" position.
- S972 : Cassette half detection switch in "off" position.
- S973 : ATS (CrO₂) switch in "off" position.
- S975 : Rec inhibit switch in "off" position.
- S976 : ATS (Metal) switch in "off" position.
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. 1K=1,000 (Ω), 1M=1,000k (Ω)
- Capacity are in micro-farads (μF) unless specified otherwise.

- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
- ()..... Voltage values at record mode.
- For measurement us EVM.
- Important safety notice
Components identified by Δ mark have special characteristics important for safety.
- When replacing any of these components, use only manufacturer's specified parts.

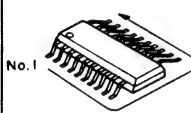
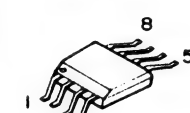
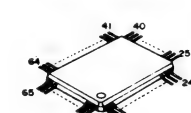
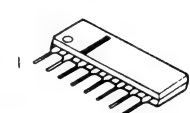
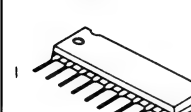

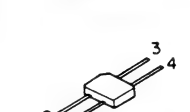



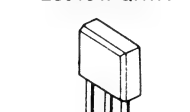
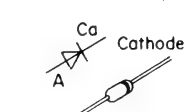
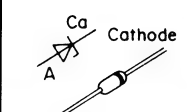



- (———— < + B > ————) indicates + B (bias).
- (———— < - B > ————) indicates - B (bias).
- (————) indicates the flow of the playback signal.
- (————) indicates the flow of the record signal.
- The supply part number is described alone in the replacement parts list.

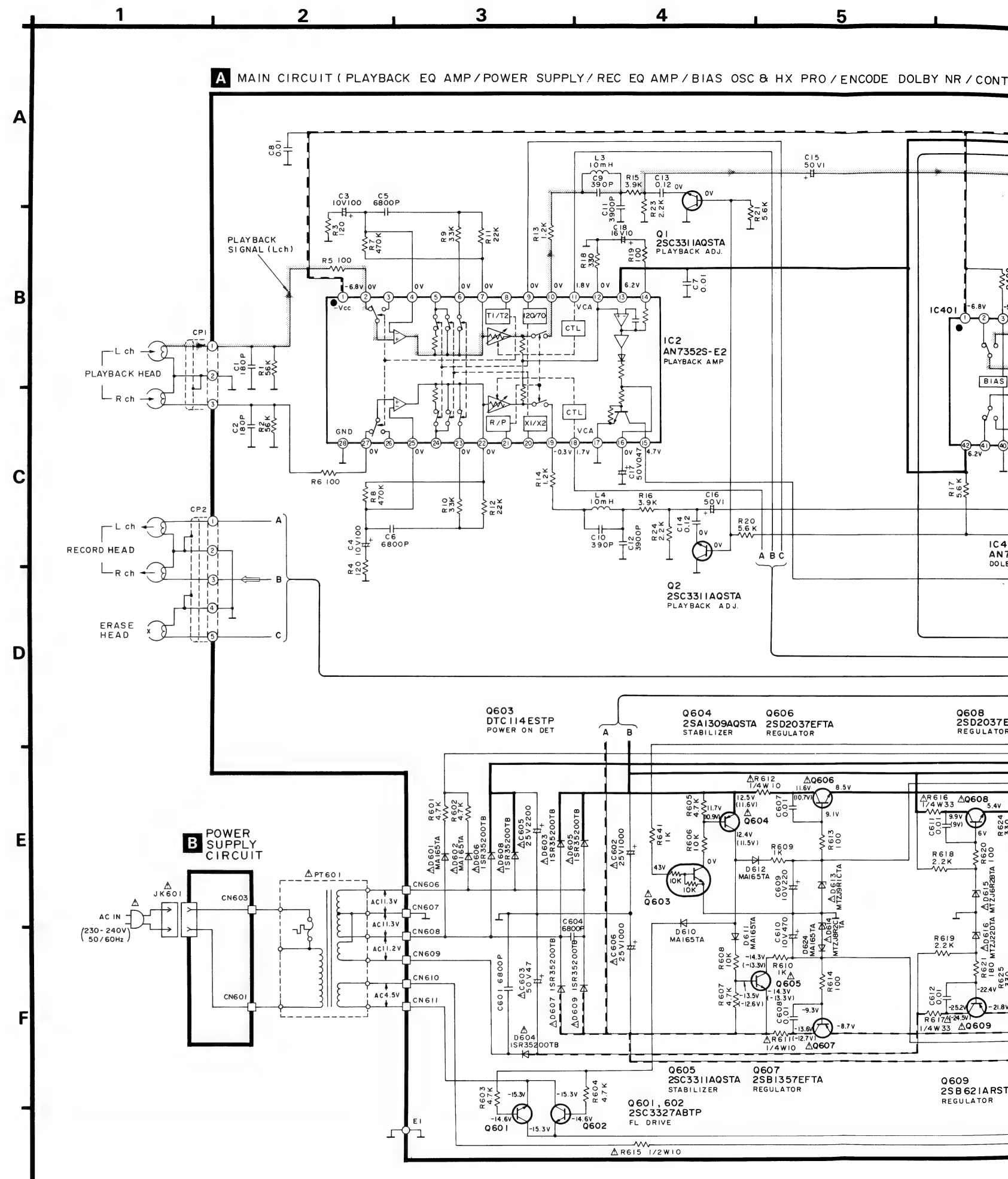
Ref. No.	Production Part No.	Supply Part No.
IC152	XLU2040F-T2	XLU2040F-T1
IC701	M5218AL	M5218L
Z502	RCDHC-278-E	RCDHC-278
Z503	GP1S53V	SVDGP1S53

*Caution!

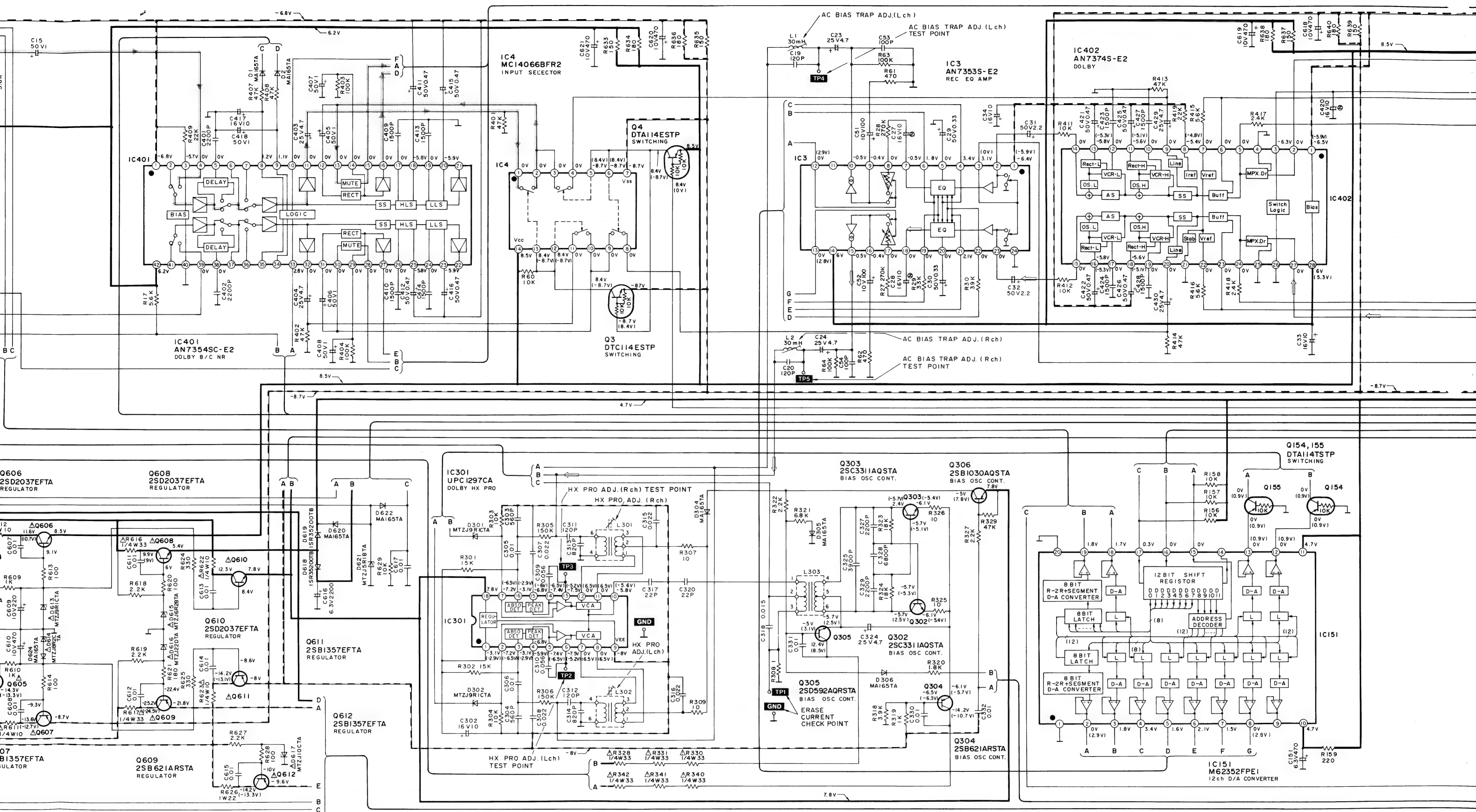
- IC and LSI are sensitive to static electricity.
- Secondary trouble can be prevented by taking care during repair.
- *Cover the parts boxes made of plastics with aluminum foil.
- *Ground the soldering iron.
- *Put a conductive mat on the work table.
- *Do not touch the legs of IC or LSI with the fingers directly.

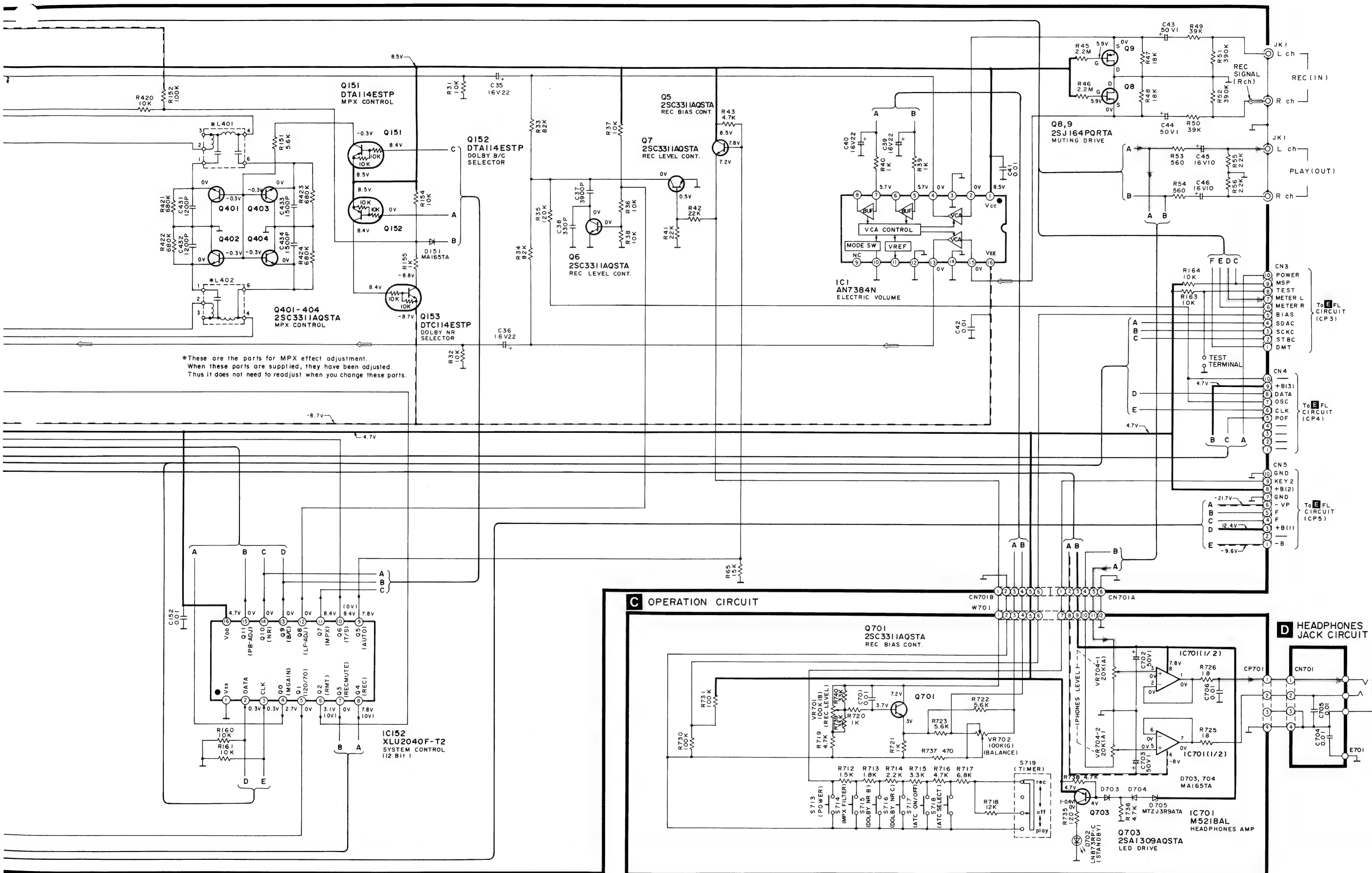
TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

 <p>MC14066BFR2 14 Pin</p> <p>XLU2040F-T2 16 Pin</p> <p>M62352FPF1 20 Pin</p> <p>AN7353S-E2 24 Pin</p>	 <p>LE93CS47M6TL</p>	 <p>M38172M2500F</p>	 <p>M5218AL</p>
 <p>BA6218</p>	 <p>AN7384N 16 Pin</p> <p>UPC1297CA 18 Pin</p>	 <p>GP2S06BC</p>	 <p>2SB621ARSTA</p> <p>2SC3327ABTP</p> <p>2SD592AQRSTA</p>
 <p>2SA1309AQSTA</p> <p>2SB1030AQSTA</p> <p>2SC3311AQSTA</p>	 <p>2SB1357EFTA</p> <p>2SD2037EFTA</p>	 <p>2SD1862QRTV6</p>	 <p>2SJ164PQRTA</p>
 <p>MTZJ39R9ATA</p> <p>MTZJ5R1BTA</p> <p>MTZJ5R6BTA</p> <p>MTZJ6R2BTA</p> <p>MTZJ8R2CTA</p> <p>MTZJ9R1CTA</p> <p>MTZJ10CTA</p> <p>MTZJ12CTA</p> <p>MTZJ22DTA</p>	 <p>LN873RP-C</p>	 <p>MA165TA</p> <p>MA700ATA</p> <p>RVD1SS133TA</p> <p>1SR35200TB</p>	 <p>Cathode</p> <p>Anode</p>



* HX PRO / ENCODE DOLBY NR / CONTROL / DECODE DOLBY NR / ELECTRIC VOLUME)





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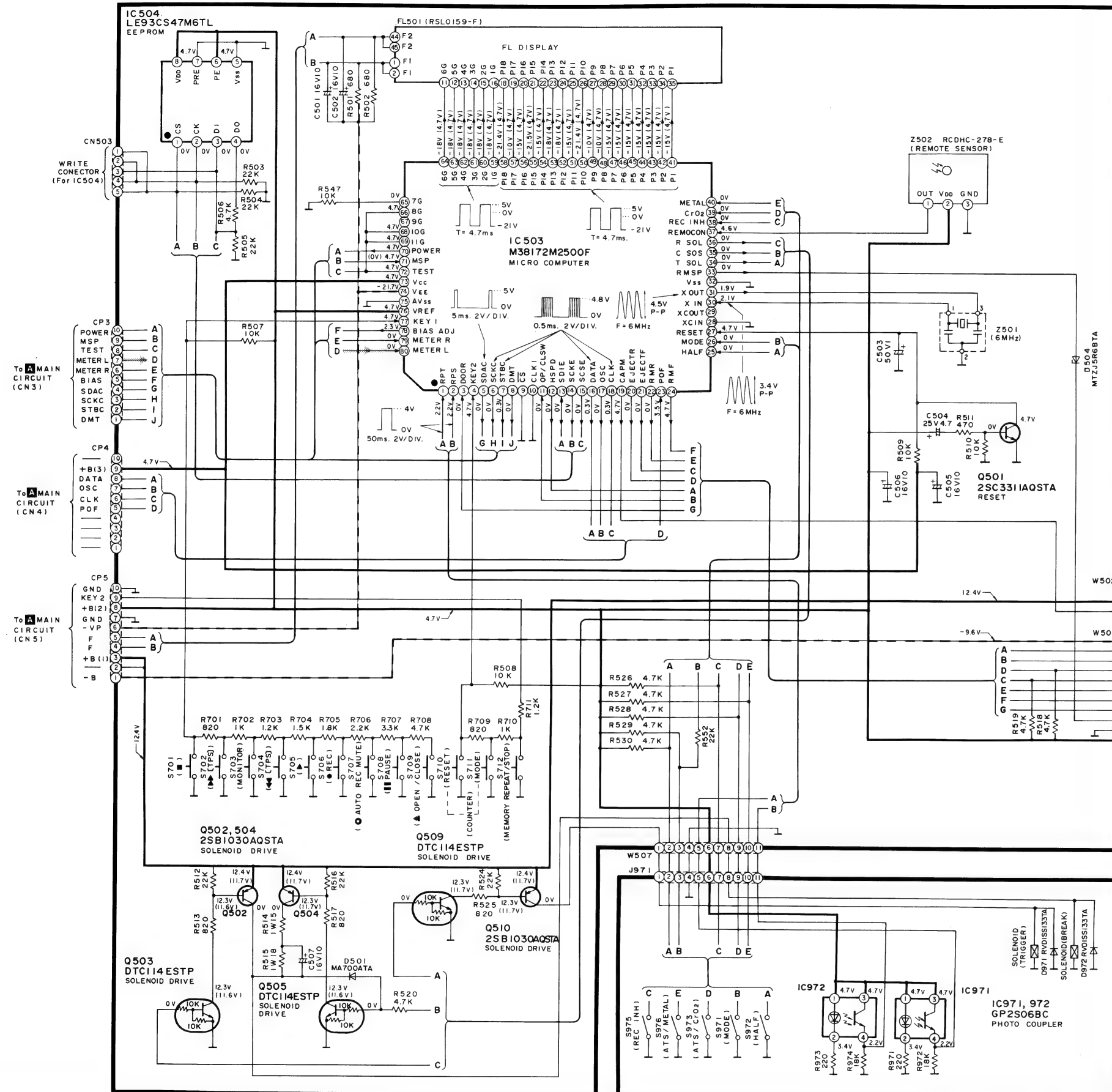
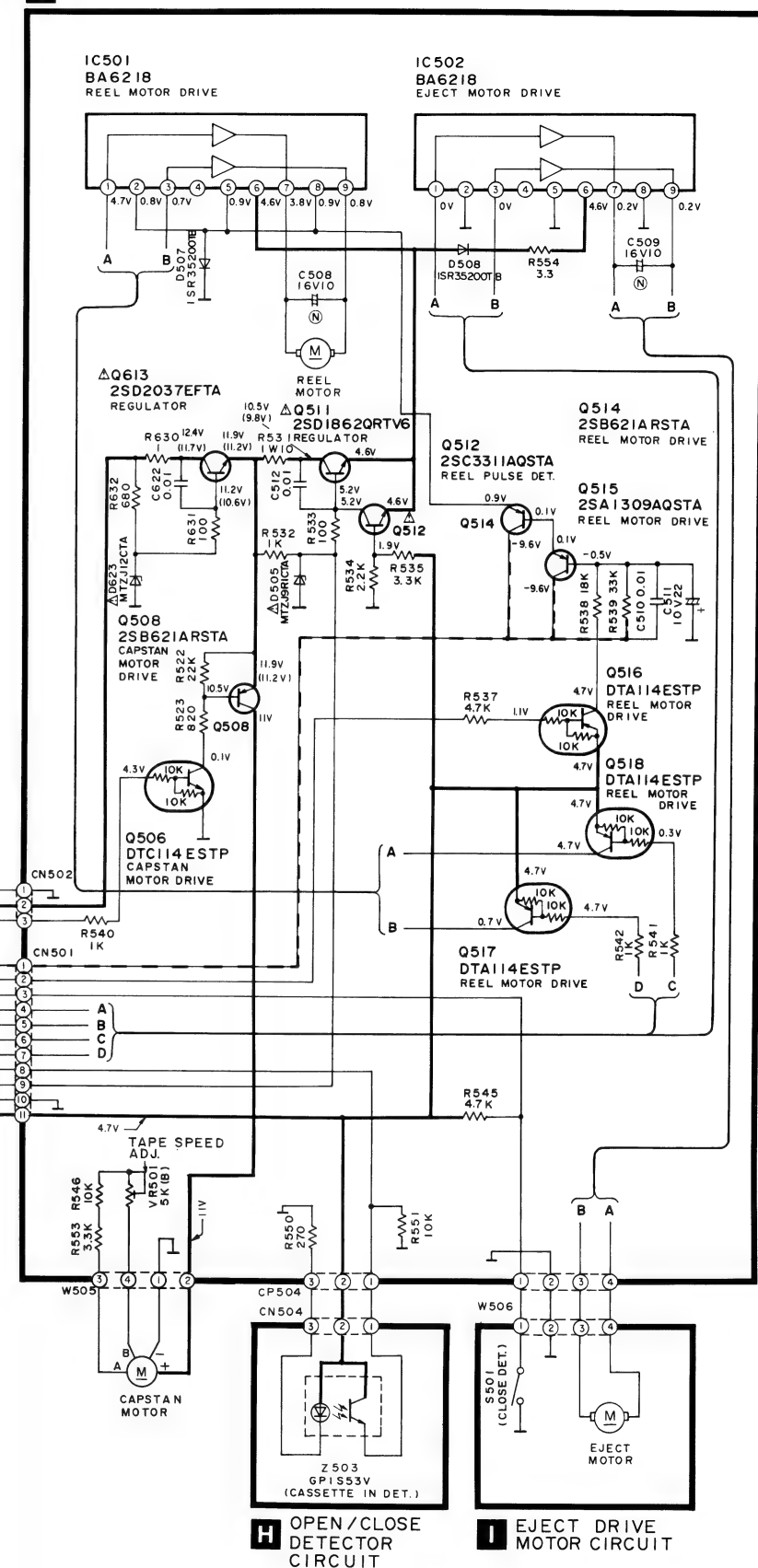
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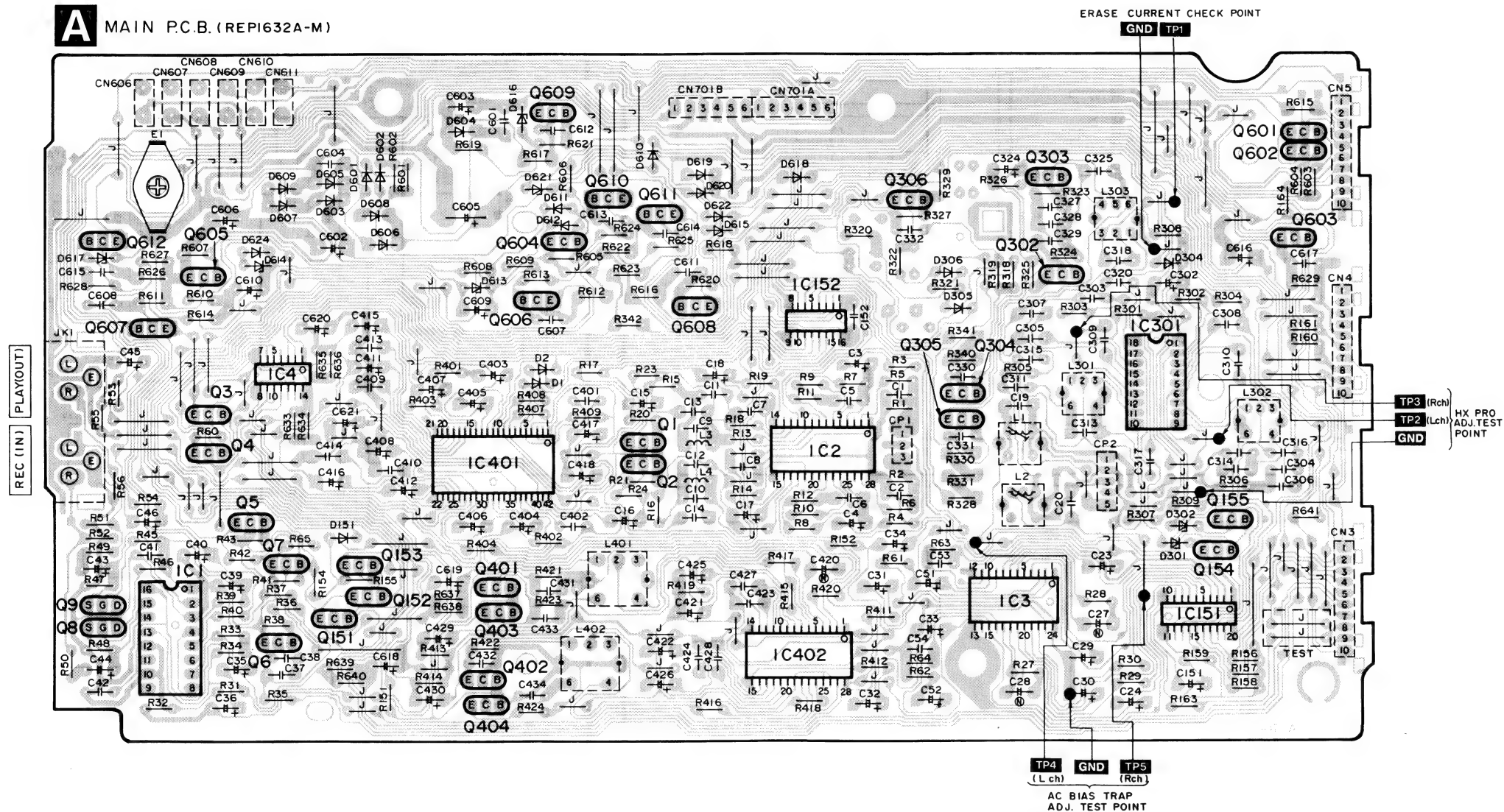
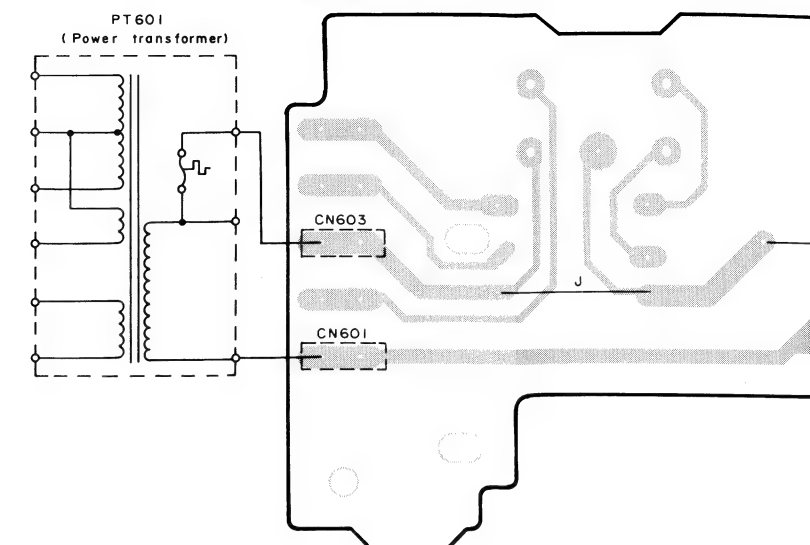
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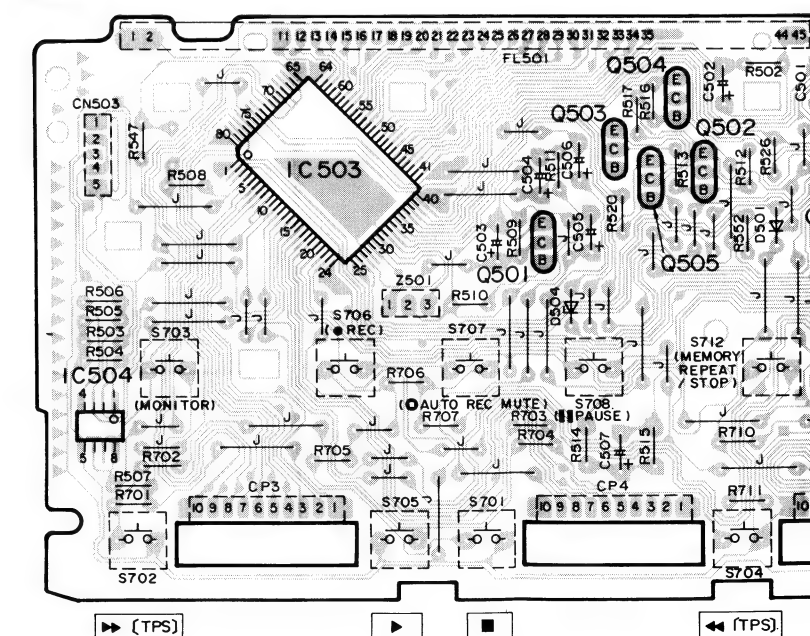
E FL CIRCUIT**F** MECHANISM CIRCUIT**G** MOTOR CIRCUIT**H** OPEN/CLOSE DETECTOR CIRCUIT**I** EJECT DRIVE MOTOR CIRCUIT

PRINTED CIRCUIT BOARDS

A MAIN P.C.B. (REPI632A-M)

**B** POWER SUPPLY P.C.B. (REP1635A-P)

F FL P.C.B. (REPI633A-S)



OPERATION P.C.B. (REPI633A-S)

POWER

REC LEVEL

BALANCE

PHONES LEVEL

TIMER

IC701

Q701

Q703

S713

S718

S719

R701

R702

R703

R704

R705

R706

R707

R708

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R733

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R735

R736

R737

R738

C701

C702

C703

C706

D701

D702

D703

D704

S713

S718

S719

VR701

VR702

VR704-1

VR704-2

W701

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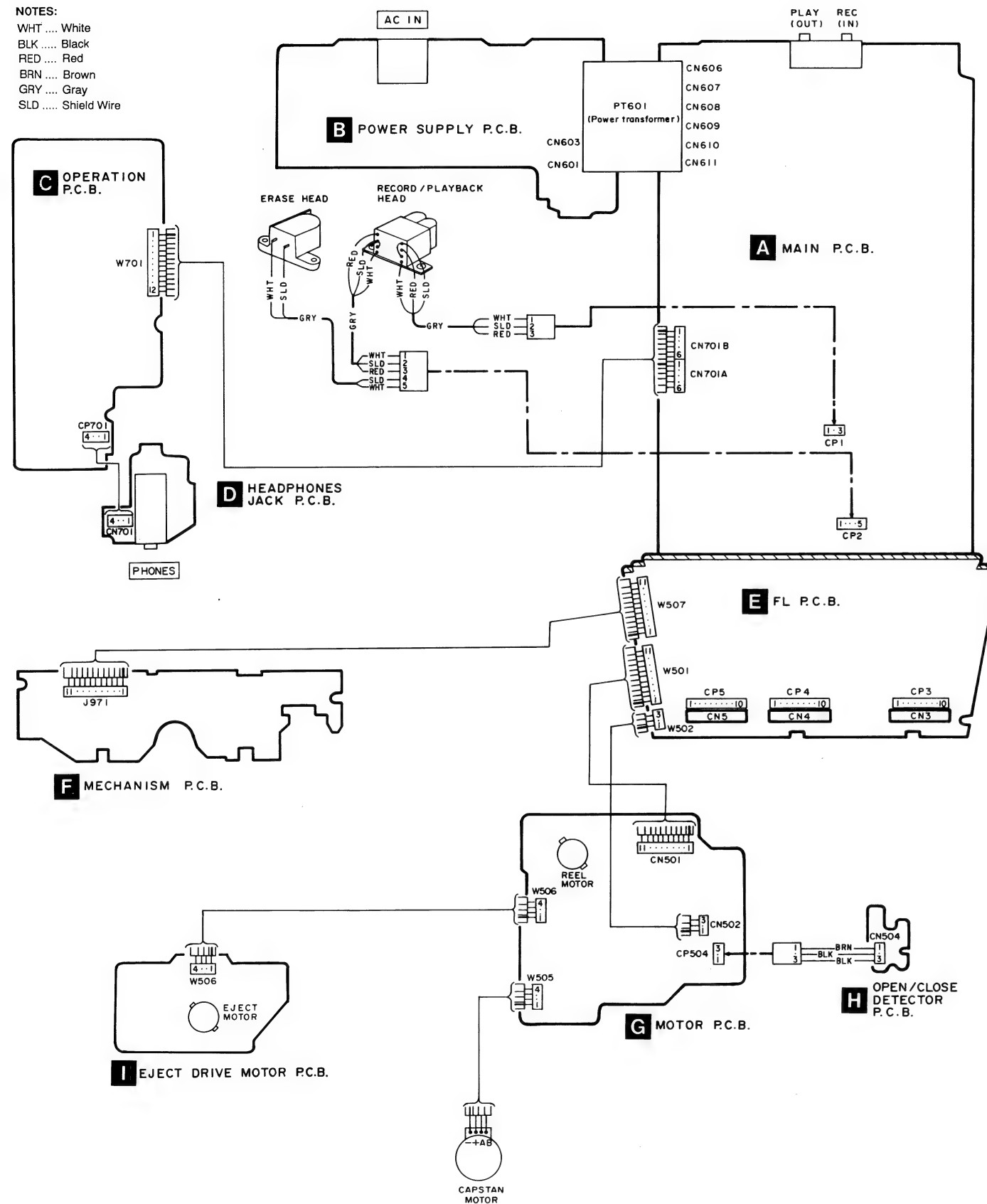
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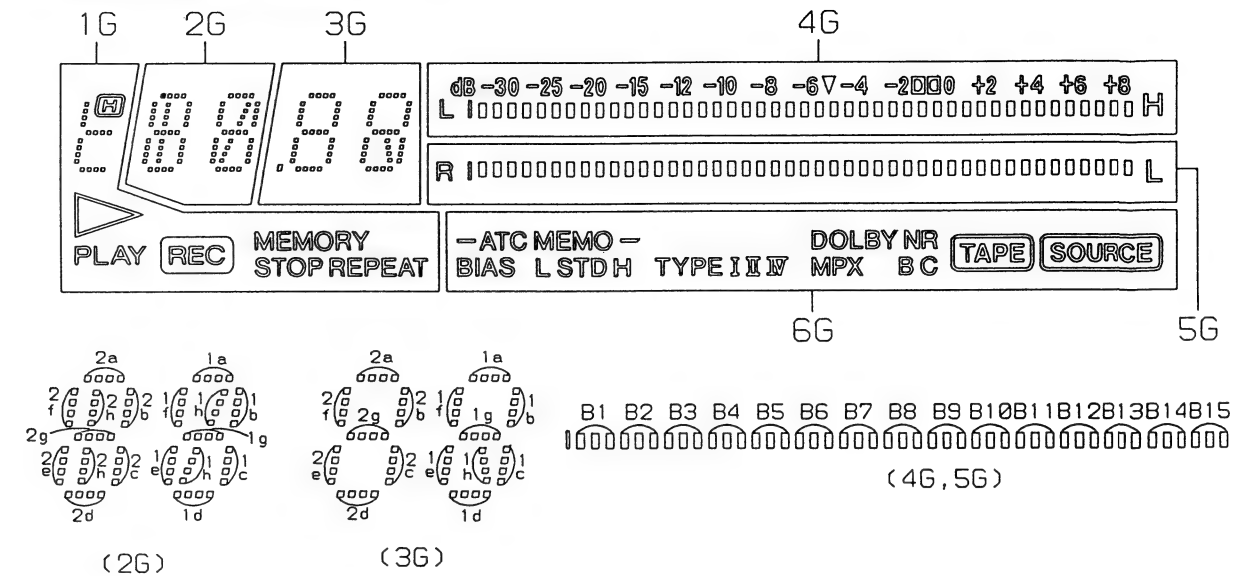
Diagram of the rear of the control panel. It shows the location of the **EJECT MOTOR** and the **S501 (CLOSE DET)** sensor. A vertical strip of four terminals is labeled **W506** with numbers **4, 3, 2, 1** from top to bottom. Wires connect these terminals to the motor and detector. The motor is represented by a circle with an 'M' and a diagonal line. The detector is represented by a rectangle with a switch symbol inside.

■ WIRING CONNECTION DIAGRAM










INTERNAL CONNECTION OF FL

- **Grid connection diagram**



- **Anode connection diagram**

	1G	2G	3G	4G	5G	6G
P1		1a	1a	B1	B1	—ATC —
P2		1b	1b	B2	B2	L
P3		1f	1f	B3	B3	STD
P4	—	1g	1g	B4	B4	H
P5	—	1c	1c	B5	B5	TYPE
P6	—	1e	1e	B6	B6	I
P7	—	1d	1d	B7	B7	II
P8		2a	2a	B8	B8	IV
P9	PLAY	2b	2b	B9	B9	MEMO
P10		2f	2f	B10	B10	—
P11	MEMORY	2g	2g	B11	B11	IAS
P12	STOP	2c	2c	B12	B12	—
P13	REPEAT	2e	2e	B13	B13	DOLBY NR
P14	—	2d	2d	B14	B14	MPX
P15	—	1h	1h	B15	B15	B
P16	—	2h	^a (DP)	—	—	C
P17	—	—	—	^b dB-30 ~ +8	R I	
P18	—	—	—	V H	L	

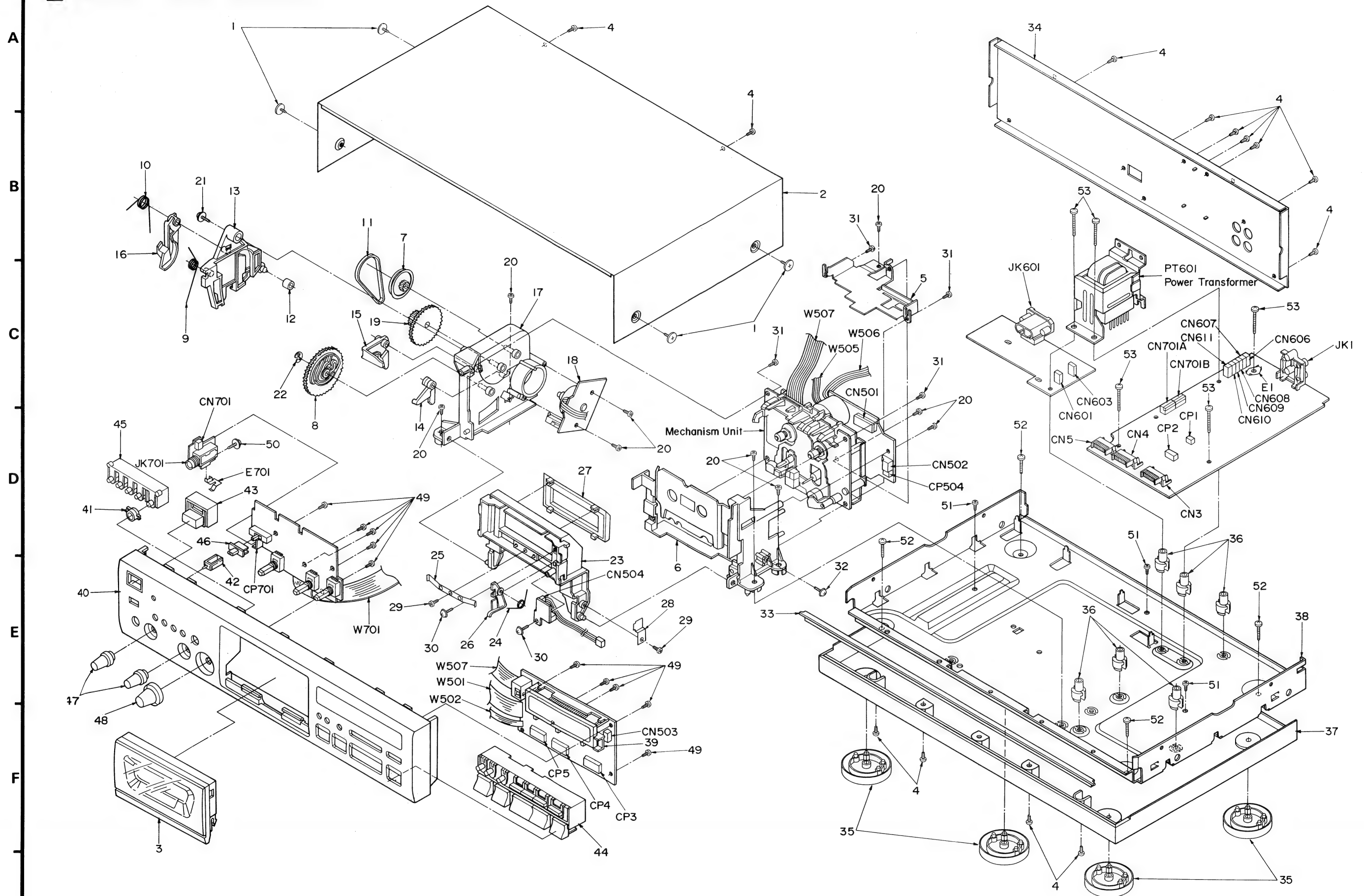
- **Pin connection**

PIN NO.	44444433333332222222222211111111111110987654321
CONNECTION	FFNNNNNNNNPPPPPPPPPPPPPPPPPPPPPPNNNNNNNNNNNNNNNNNNNNNN

Note

- | | |
|--------------------------|--------------------------|
| 1) F1, F2..... Filament | 4) NC..... No connection |
| 2) NP..... No pin | 5) DL..... Datum Line |
| 3) NX..... No extend pin | 6) 1G~6G..... Grid |

■ CABINET PARTS LOCATION



REPLACEMENT PARTS LIST

Notes: *Important safety notice:

 Components identified by Δ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

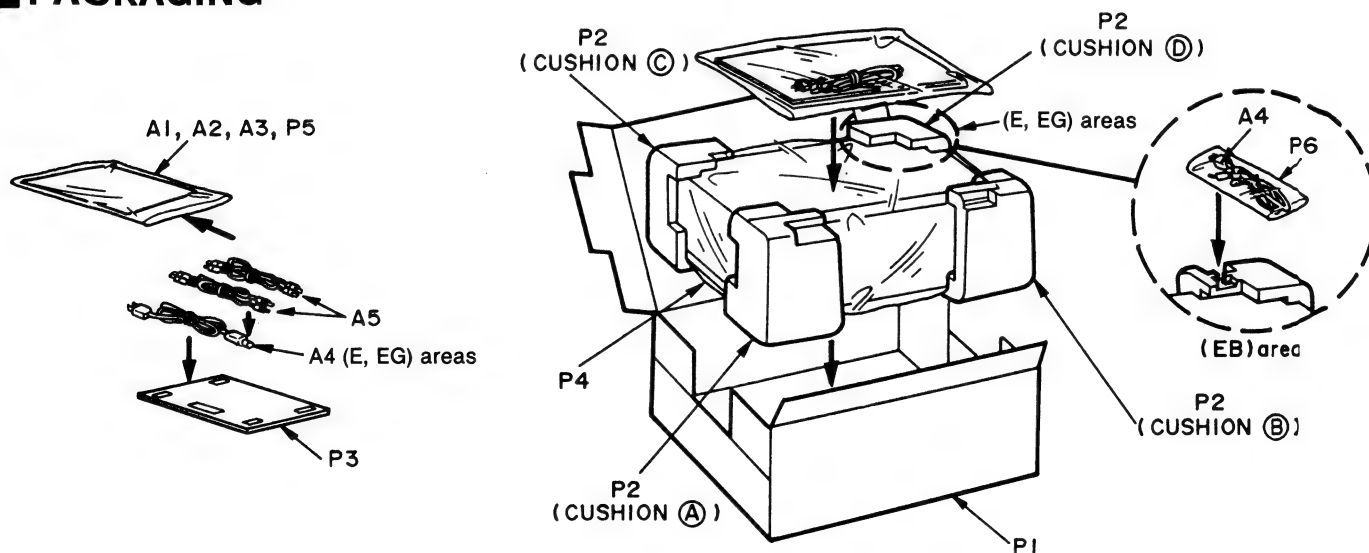
*The "(SF)" mark denotes the standard part.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS		44	RGU0883-K	BUTTON, OPERATION	
				45	RGU0885-K	BUTTON, ATC	
1	RHD30035-K	SCREW		46	RGV0112-K	KNOB, TIMER	
2	RKM0114-K	CABINET		47	RGW0175-K	KNOB, H. P. LEVEL/BALANCE	
3	RYF0216-K	CASSETTE LID		48	RGW0177-K	KNOB, REC. LEVEL	
4	XTBS3+8JFZ1	SCREW		49	XTBS26+8J	SCREW	
5	RMA0693	MECHA. SHIELD PLATE		50	XTWS3+10T	SCREW	
6	RFKNBX747EAK	MECHANISM BASE ASS'Y		51	XTB3+10GFZ	SCREW	
7	RDG0081	PULLEY GEAR		52	XTB3+16CFN	SCREW	
8	RDG0242	DRIVE GEAR		53	XTB3+20JFZ	SCREW	
9	RME0134	CLOSE SPRING				PACKING MATERIAL	
10	RME0138	DRIVE ARM SPRING					
11	RMG0121	BELT		P1	RPG1621	PACKING CASE	(E, EG)
12	RMG0330-C	CUSHION RUBBER		P1	RPG1622-1	PACKING CASE	(EB)
13	RML0305	DRIVE LEVER		P2	RPN0697	CUSHION	(E, EG)
14	RML0306	SWITCH LEVER		P2	RPN0698	CUSHION	(EB)
15	RML0307	ATS ARM		P3	RPQ0164	ACCESSORIES PAD	
16	RML0311	FRICTION		P4	XZB52X60A01Z	PROTECTION COVER (THIS UNIT)	
17	RFKNBX747EBK	LOADING BASE ASS'Y		P5	XZB24X34C04	PROTECTION BAG (F. B., ACC.)	
18	REM0026	LOADING MOTOR ASS'Y		P6	RPH0032	MIRROR SHEET	(EB)
19	SFUGF01N02	INTERMEDIATE GEAR				ACCESSORIES	
20	XTB3+8JFZ	SCREW					
21	XTWS3+10Q	SCREW					
22	XUC3FY	E RING		A1	RFKSBX747E-K	INSTRUCTION MANUAL ASS'Y	(E)
23	RFKNBX747ECK	CASSETTE HOLDER ASS'Y		A1	RFKSBX747EGK	INSTRUCTION MANUAL ASS'Y	(EG)
24	RMB0286	SWITCH LEVER SPRING		A1	RQT2029-B	INSTRUCTION MANUAL	(EB)
25	RMCO038	STABILIZER SPRING		A2	RQA0013	WARRANTY CARD	
26	RML0308	DETECTION LEVER		A3	RQCB0169	SERVICENTER LIST	
27	RMQ0371	STABILIZER		A4	RJA0019-2K	AC POWER SUPPLY CORD	(E, EG) Δ (SF)
28	RMQ0407	ANGLE		A4	VJA0733	AC POWER SUPPLY CORD	(EB) Δ (SF)
29	XTB3+6J	SCREW		A5	SJP2276	STEREO CONNECTION CABLE	
30	XTW2+5L	SCREW					
31	XTB3+10JFZ	SCREW					
32	XTW3+8J	SCREW					
33	RGK0550-T	MOLE					
34	RGRO169A-A1	REAR PANEL	(E, EG)				
34	RGRO169A-B1	REAR PANEL	(EB)				
35	RKA0053-A	FOOT					
36	RKQ0089	P. C. B. HOLDER					
37	RKU0049A-K	BOTTOM BOARD					
38	RMK0202A	BOTTOM CHASSIS					
39	RMN0221	FL. HOLDER					
40	RFKGBX646E-K	FRONT PANEL ASS'Y					
41	RGK0534-N	ORNAMENT, ATC BUTTON					
42	RGL0206-Q	PANEL LIGHT					
43	RGU0882-K	BUTTON, POWER					

Ref. No.	Part No.	Part Name & Description	Remarks
		MECHANISM PARTS LIST	
101	QH1361A	SCREW	
102	SJH96-1	E HEAD	
103	RHE5201ZA	SCREW	
104	RBR4CY009-C	R/P HEAD	
105	QBC1278A	HEAD SPRING	
106	RMX0014	SPACER	
107	RMR0184	HEAD SPACER	
108	XTN2+5F	SCREW	
109	REX0092-1	LEAD WIRE BLOCK	
110	RXR0009	REEL TABLE	
111	RUW139ZA	HEAD BASE SPRING	
112	RMA0047A-1	HEAD BASE	
113	RXQ0078	MAIN ROD ASS'Y	
114	RMM0012-2	EJECT ROD (L)	
115	RME0018-1	SPRING, EJECT ROD (L)	
116	RML0069-1	LEVER	
117	RME0020	BRAKE SPRING	
118	RML0040-2	BRAKE LEVER	
119	RUW142ZA	SPRING	
120	RXP0004	PINCH ROLLER ARM (F)	
120-1	RUW140ZC	SPRING, PINCH ROLLER ARM (F)	
121	RFKRSB555E-K	CHASSIS ASS'Y	
122	MMN-6F4RA88	REEL MOTOR	
123	RFM133ZA	DC MOTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
124	XTN26+7J	SCREW	
125	XTN26+26F	SCREW	
126	RMA0048	FLYWHEEL PLATE	
127	RMD5014ZC	ANGLE	
128	XSN26+3	SCREW	
129	RHG3032ZA	RUBBER CUSHION	
130	RHD26002	SCREW	
131	RUB428ZE	MOVING IRON CORE	
132	RSJ0003	SOLENOID	
133	XTW2+8S	SCREW	
134	RXQ0011	BRAKE SOLENOID	
135	XTN26+4F	SCREW	
136	RDG0030	MAIN GEAR	
137	RXG0009	IDLE GEAR ASS'Y	
138	RXF0007	FLYWHEEL (F)	
139	RDV109ZA	CAPSTAN BELT	
140	RDG0034	REEL MOTOR GEAR	
141	RXG0003	REEL TABLE GEAR	
142	RUQ112ZA	SPRING	
143	REX0093-2	LEAD WIRE BLOCK	
144	RUQ111ZB	SPRING	
145	RML0037	TRIGGER LEVER	
146	RUW147ZA	TRIGGER LEVER SPRING	
147	RUS609ZC	TAPE PRESSURE SPRING	
148	RJS11T7ZA	CONNECTOR (11P), J971	
149	RHW31002	WASHER	

■ PACKAGING

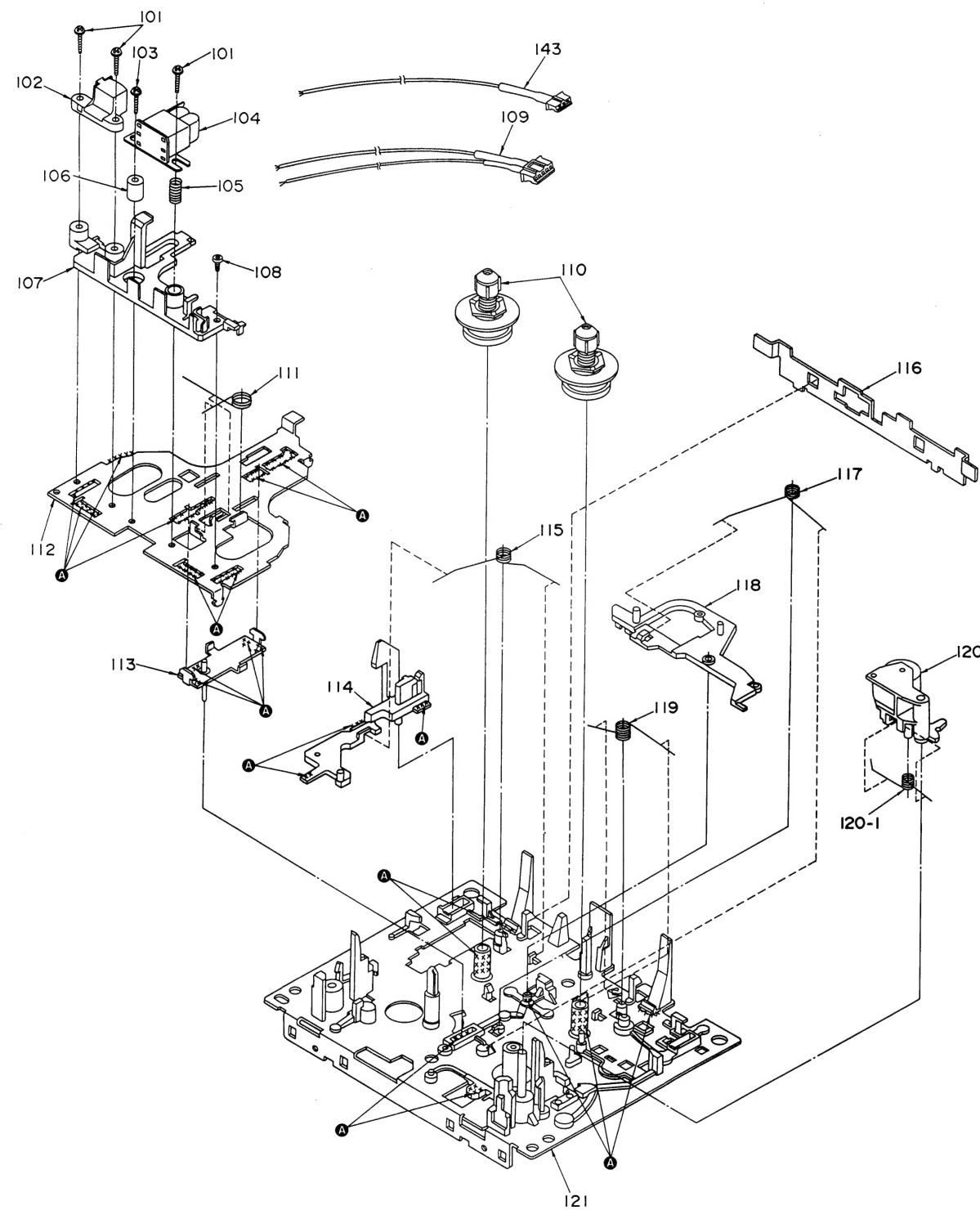


〈CUSHION (A), (B), (C), (D) Part No.: RPN0697 (E, EG), RPN0698 (EB)〉

MECHANISM PARTS LOCATION

(Top view)

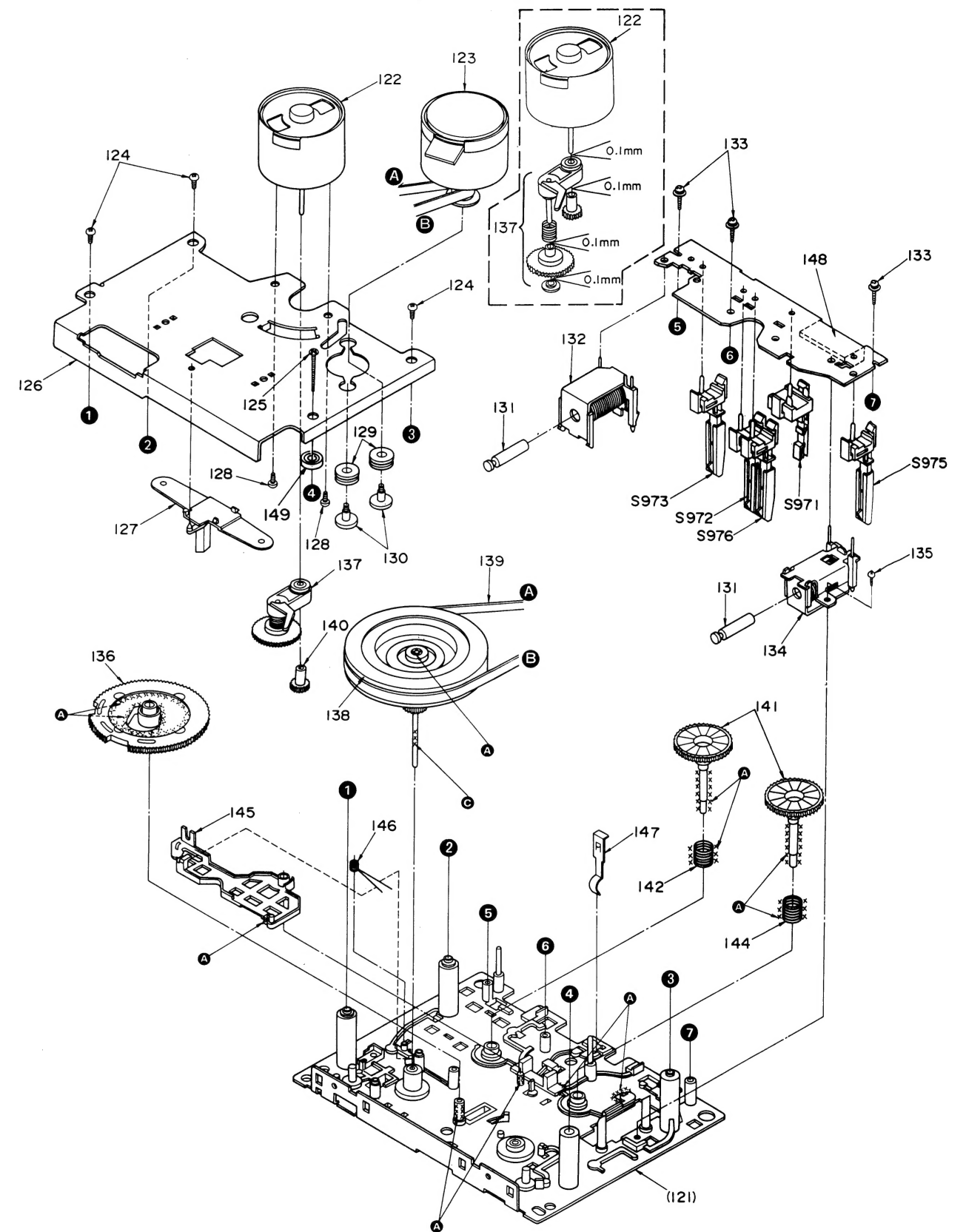
(Bottom view)



Note:

When changing mechanism parts, apply the specified grease to areas marked "x" as shown in the drawing.

Ref. No.	Part Name	Part No.
A	FLOIL AK-152	SZZ0L18
C	SWAFLUID #56	RZZ0L02



REPLACEMENT PARTS LIST

Notes: *Important safety notice:
Components identified by Δ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)		Q601, 602	2SC3327-A	TRANSISTOR	
				Q603	DTC114ESTP	TRANSISTOR	Δ
				Q604	2SA1309A-R	TRANSISTOR	Δ
IC1	AN7384N	ELECTRIC VOLUME		Q605	2SC3311A-Q	TRANSISTOR	Δ
IC2	AN7352S-E2	PLAYBACK AMP		Q606	2SD2037EFTA	TRANSISTOR	Δ
IC3	AN7353S-E2	REC EQ AMP		Q607	2SB1357EFTA	TRANSISTOR	Δ
IC4	MC14066BFR2	INPUT SELECTOR		Q608	2SD2037EFTA	TRANSISTOR	Δ
IC151	M62352FPE1	12ch D/A CONVERTER		Q609	2SB621A-R	TRANSISTOR	Δ
IC152	XLU2040F-T1	SYSTEM CONTROL (12BIT)		Q610	2SD2037EFTA	TRANSISTOR	Δ
IC301	UPC1297CA	DOLBY HX PRO		Q611, 612	2SB1357EFTA	TRANSISTOR	Δ
IC401	AN7354SC-E2	DOLBY B/C NR		Q613	2SD2037EFTA	TRANSISTOR	Δ
IC402	AN7374S-E2	DOLBY		Q701	2SC3311A-Q	TRANSISTOR	
IC501	BA6218	REEL MOTOR DRIVE		Q703	2SA1309A-R	TRANSISTOR	
IC502	BA6218	EJECT MOTOR DRIVE				DIODE (S)	
IC503	M38172M2500F	MICROCOMPUTER					
IC504	LE93CS47M6TL	EEPROM		D1, 2	MA165	DIODE	
IC701	M5218L	HEADPHONES AMP		D151	MA165	DIODE	
IC971, 972	GP2S06BC	PHOTO COUPLER		D301, 302	MTZJ9R1CTA	DIODE	
		TRANSISTOR(S)		D304-306	MA165	DIODE	
				D501	MA700	DIODE	
Q1, 2	2SC3311A-Q	TRANSISTOR		D504	MTZJ5R6BTA	DIODE	
Q3	DTC114ESTP	TRANSISTOR		D505	MTZJ9R1CTA	DIODE	Δ
Q4	DTA114ESTP	TRANSISTOR		D507, 508	1SR35200TB	DIODE	
Q5-7	2SC3311A-Q	TRANSISTOR		D601, 602	MA165	DIODE	Δ
Q8, 9	2SJ164PQRTA	TRANSISTOR		D603-609	1SR35200TB	DIODE	Δ
Q151, 152	DTA114ESTP	TRANSISTOR		D610-612	MA165	DIODE	
Q153	DTC114ESTP	TRANSISTOR		D613	MTZJ9R1CTA	DIODE	Δ
Q154, 155	DTA114ESTP	TRANSISTOR		D614	MTZJ8R2CTA	DIODE	Δ
Q302, 303	2SC3311A-Q	TRANSISTOR		D615	MTZJ6R2BTA	DIODE	Δ
Q304	2SB621A-R	TRANSISTOR		D616	MTZJ22DTA	DIODE	Δ
Q305	2SD592ANCQ	TRANSISTOR		D617	MTZJ10CTA	DIODE	Δ
Q306	2SB1030AQSTA	TRANSISTOR		D618, 619	1SR35200TB	DIODE	
Q401-404	2SC3311A-Q	TRANSISTOR		D620	MA165	DIODE	
Q501	2SC3311A-Q	TRANSISTOR		D621	MTZJ5R1BTA	DIODE	
Q502	2SB1030AQSTA	TRANSISTOR		D622	MA165	DIODE	
Q503	DTC114ESTP	TRANSISTOR		D623	MTZJ12CTA	DIODE	Δ
Q504	2SB1030AQSTA	TRANSISTOR		D624	MA165	DIODE	
Q505, 506	DTC114ESTP	TRANSISTOR		D702	LN873RP-C	L. E. D.	
Q508	2SB621A-R	TRANSISTOR		D703, 704	MA165	DIODE	
Q509	DTC114ESTP	TRANSISTOR		D705	MTZJ3R9ATA	DIODE	
Q510	2SB1030AQSTA	TRANSISTOR		D971, 972	RVD1SS133TA	DIODE	
Q511	2SD1862QRTV6	TRANSISTOR	Δ				
Q512	2SC3311A-Q	TRANSISTOR	Δ			VARIABLE RESISTOR(S)	
Q514	2SB621A-R	TRANSISTOR					
Q515	2SA1309A-R	TRANSISTOR		VR501	EVNDCAA03B53	TAPE SPEED ADJ.	
Q516-518	DTA114ESTP	TRANSISTOR		VR701	EVJ02FF02B15	REC LEVEL CONTROL	

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
VR702	EVJ02SF02G15	BALANCE CONTROL				CONNECTOR(S) AND SOCKET(S)	
VR704	EVJY10F02A24	HEADPHONES CONTROL					
		COIL (S)		CN3-5	RJU003K010M1	SOCKET (10P)	
				CN501	RJS11T7ZA	CONNECTOR (11P)	
L1, 2	RLZ0003	COIL (AC BIAS TRAP ADJ.)		CN502	SJT30344-H	CONNECTOR (3P)	
L3, 4	RLQB103JT-Y	COIL		CN503	SJS50581BB	SOCKET (5P)	
L301, 302	SL09B1-Z	COIL		CN504	REX0508	CONNECTOR ASS'Y (3P)	
L303	SL09B4-K	COIL (HX PRO ADJ.)		CN601	RJS1A1101T1	SOCKET (1P)	
L401, 402	QLM9Z10K	COIL		CN603	RJS1A1101T1	SOCKET (1P)	
		TRANSFORMER		CN606-611	RJS1A1101T1	SOCKET (1P)	
PT601	RTP1K4B016-V	POWER TRANSFORMER	Δ	CN701	RJU057W004	SOCKET (4P)	
		COMPONENT COMBINATION (S)		CN701A	RJS1A6606	CONNECTOR (6P)	
				CN701B	RJS1A6606	CONNECTOR (6P)	
Z501	EFOEC6004T4	CERAMIC OSCILLATOR (6MHz)		CP1	SJTD313	CONNECTOR (3P)	
Z502	RCDHC-278	REMOTE SENSOR		CP2	RJP5G18ZA	CONNECTOR (5P)	
Z503	SVDGP1S53	PHOTO COUPLER		CP3-5	RJT003K010-1	CONNECTOR (10P)	
		DISPLAY TUBE (S)		CP504	RJP3G17ZA	CONNECTOR (3P)	
				CP701	RJT057W004-1	CONNECTOR (4P)	
						JACK (S)	
FL501	RSL0159-F	DISPLAY TUBE		JK1	SJF3069N	TERMINAL BOARD: REC/PLAY	
		SWITCH (ES)		JK601	SJS9236	AC INLET	Δ
				JK701	RJJ63TA01	HEADPHONES JACK	
						GND PART (S)	
S501	RSH1A005	CLOSE; LOADING					
S701	EVQ21405R	STOP		E1	SNE1004-1	GND PLATE	
S702	EVQ21405R	F. F. <TPS>		E701	RMC0210	GND PLATE	
S703	EVQ21405R	MONITOR				FLAT CABLE (S)	
S704	EVQ21405R	REW<TPS>					
S705	EVQ21405R	PLAYBACK					
S706	EVQ21405R	REC		W501	RWJ5711230KX	FLAT CABLE (11P)	
S707	EVQ21405R	AUTO REC MUTE		W502	RWJ1803200KX	FLAT CABLE (3P)	
S708	EVQ21405R	PAUSE		W505	RWJ1804090DK	FLAT CABLE (4P)	
S709	EVQ21405R	OPEN/CLOSE; CASSETTE HOLDER		W506	RWJ1804100KK	FLAT CABLE (4P)	
S710	EVQ21405R	COUNTER RESET		W507	RWJ5711300KX	FLAT CABLE (11P)	
S711	EVQ21405R	COUNTER MODE		W701	RWJ1812390KX	FLAT CABLE (12P)	
S712	EVQ21405R	MEMORY REPEAT/STOP					
S713	EVQ21405R	POWER					
S714	EVQ21405R	MPX FILTER					
S715	EVQ21405R	DOLBY NR B					
S716	EVQ21405R	DOLBY NR C					
S717	EVQ21405R	ATC ON/OFF (A. T. CALIBRATION)					
S718	EVQ21405R	ATC SELECT					
S719	RSS3A18YA-H	TIMER					
S971	RSH1A89ZD-U	MODE					
S972	RSH1A90YD-U	HALF					
S973	RSH1A90YD-U	ATS					
S975	RSH1A90YD-U	REC INHIBIT					
S976	RSH1A90YD-U	ATS					

RESISTORS AND CAPACITORS

Notes : * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1 K=1,000 (OHM), 1 M=1,000k (OHM)

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS						
R1, 2	ERDS2TJ563	1/4W 56K	R309	ERDS2TJ100	1/4W 10	R540-542	ERDS2TJ102	1/4W 1K
R3, 4	ERDS2EJ121	1/4W 120	R318	ERDS2TJ392T	1/4W 3.9K	R545	ERDS2TJ472	1/4W 4.7K
R5, 6	ERDS2TJ101	1/4W 100	R319	ERDS2TJ102	1/4W 1K	R546, 547	ERDS2TJ103	1/4W 10K
R7, 8	ERDS2TJ474	1/4W 470K	R320	ERDS2TJ182	1/4W 1.8K	R550	ERDS2TJ271	1/4W 270
R9, 10	ERDS2TJ333	1/4W 33K	R321	ERDS2TJ682T	1/4W 6.8K	R551	ERDS2TJ103	1/4W 10K
R11, 12	ERDS2TJ223	1/4W 22K	R322	ERDS2TJ222	1/4W 2.2K	R552	ERDS2TJ223	1/4W 22K
R13, 14	ERDS2TJ122	1/4W 1.2K	R323, 324	ERDS2TJ183T	1/4W 18K	R553	ERDS2TJ332	1/4W 3.3K
R15, 16	ERDS2TJ392T	1/4W 3.9K	R325, 326	ERDS2TJ100	1/4W 10	R554	ERDS2TJ3R3T	1/4W 3.3
R17	ERDS2TJ562	1/4W 5.6K	R327	ERDS2TJ222	1/4W 2.2K	R601-605	ERDS2TJ472	1/4W 4.7K
R18	ERDS2TJ331	1/4W 330	R328	ERD2FCVG330T	1/4W 33 Δ	R606	ERDS2TJ103	1/4W 10K
R19	ERDS2TJ101	1/4W 100	R329	ERDS2TJ473	1/4W 47K	R607	ERDS2TJ472	1/4W 4.7K
R20, 21	ERDS2TJ562	1/4W 5.6K	R330, 331	ERD2FCVG330T	1/4W 33 Δ	R608	ERDS2TJ103	1/4W 10K
R23, 24	ERDS2TJ222	1/4W 2.2K	R340-342	ERD2FCVG330T	1/4W 33 Δ	R609, 610	ERDS2TJ102	1/4W 1K
R27, 28	ERDS2TJ274	1/4W 270K	R401, 402	ERDS2TJ473	1/4W 47K	R611, 612	ERD2FCVG100T	1/4W 10 Δ
R29	ERDS2TJ333	1/4W 33K	R403, 404	ERDS2TJ104	1/4W 100K	R613, 614	ERDS2TJ101	1/4W 100
R30	ERDS2TJ393	1/4W 39K	R407, 408	ERDS2TJ473	1/4W 47K	R615	ERDS1FVJ100T	1/2W 10 Δ
R31, 32	ERDS2TJ103	1/4W 10K	R409	ERDS2TJ223	1/4W 22K	R616, 617	ERD2FCVG330T	1/4W 33 Δ
R33, 34	ERDS2TJ823T	1/4W 82K	R411, 412	ERDS2TJ103	1/4W 10K	R618, 619	ERDS2TJ222	1/4W 2.2K
R35	ERDS2TJ124T	1/4W 120K	R413, 414	ERDS2TJ473	1/4W 47K	R620	ERDS2TJ101	1/4W 100
R36-38	ERDS2TJ103	1/4W 10K	R415, 416	ERDS2TJ562	1/4W 5.6K	R621	ERDS2TJ181T	1/4W 180
R39, 40	ERDS2TJ102	1/4W 1K	R417, 418	ERDS2TJ242	1/4W 2.4K	R622, 623	ERD2FCVG100T	1/4W 10 Δ
R41, 42	ERDS2TJ223	1/4W 22K	R419	ERDS2TJ223	1/4W 22K	R624, 625	ERDS2TJ331	1/4W 330
R43	ERDS2TJ472	1/4W 4.7K	R420	ERDS2TJ103	1/4W 10K	R626	ERG1SJ220E	1W 22
R45, 46	ERDS2TJ225	1/4W 2.2M	R421-424	ERDS2TJ684	1/4W 680K	R627	ERDS2TJ222	1/4W 2.2K
R47, 48	ERDS2TJ183T	1/4W 18K	R501, 502	ERDS2TJ681	1/4W 680	R628	ERDS2TJ101	1/4W 100
R49, 50	ERDS2TJ393	1/4W 39K	R503-505	ERDS2TJ223	1/4W 22K	R629	ERDS2TJ103	1/4W 10K
R51, 52	ERDS2TJ394	1/4W 390K	R506	ERDS2TJ472	1/4W 4.7K	R630	ERDS2TJ1R0	1/4W 1.0
R53, 54	ERDS2TJ561	1/4W 560	R507-510	ERDS2TJ103	1/4W 10K	R631	ERDS2TJ101	1/4W 100
R55, 56	ERDS2TJ222	1/4W 2.2K	R511	ERDS2TJ471	1/4W 470	R632	ERDS2TJ681	1/4W 680
R60	ERDS2TJ103	1/4W 10K	R512	ERDS2TJ223	1/4W 22K	R633	ERDS2TJ151	1/4W 150
R61, 62	ERDS2TJ471	1/4W 470	R513	ERDS2TJ821	1/4W 820	R634	ERDS2TJ181T	1/4W 180
R63, 64	ERDS2TJ104	1/4W 100K	R514	ERG1SJ150E	1W 15	R635	ERDS2TJ151	1/4W 150
R65	ERDS2TJ153	1/4W 15K	R515	ERG1SJ180E	1W 18	R636	ERDS2TJ181T	1/4W 180
R151	ERDS2TJ562	1/4W 5.6K	R516	ERDS2TJ223	1/4W 22K	R637	ERDS2TJ151	1/4W 150
R152	ERDS2TJ104	1/4W 100K	R517	ERDS2TJ821	1/4W 820	R638	ERDS2TJ181T	1/4W 180
R154	ERDS2TJ103	1/4W 10K	R518-520	ERDS2TJ472	1/4W 4.7K	R639	ERDS2TJ151	1/4W 150
R155	ERDS2TJ102	1/4W 1K	R522	ERDS2TJ223	1/4W 22K	R640	ERDS2TJ181T	1/4W 180
R156-158	ERDS2TJ103	1/4W 10K	R523	ERDS2TJ821	1/4W 820	R641	ERDS2TJ102	1/4W 1K
R159	ERDS2TJ221	1/4W 220	R524	ERDS2TJ223	1/4W 22K	R701	ERDS2TJ821	1/4W 820
R160, 161	ERDS2TJ103	1/4W 10K	R525	ERDS2TJ821	1/4W 820	R702	ERDS2TJ102	1/4W 1K
R163, 164	ERDS2TJ103	1/4W 10K	R526-530	ERDS2TJ472	1/4W 4.7K	R703	ERDS2TJ122	1/4W 1.2K
R301, 302	ERDS2TJ153	1/4W 15K	R531	ERG1SJ100E	1W 10	R704	ERDS2TJ152	1/4W 1.5K
R303, 304	ERDS2TJ103	1/4W 10K	R532	ERDS2TJ102	1/4W 1K	R705	ERDS2TJ182	1/4W 1.8K
R305, 306	ERDS2TJ154	1/4W 150K	R533	ERDS2TJ101	1/4W 100	R706	ERDS2TJ222	1/4W 2.2K
R307	ERDS2TJ100	1/4W 10	R534	ERDS2TJ222	1/4W 2.2K	R707	ERDS2TJ332	1/4W 3.3K
R308	ERDS2TJ1R0	1/4W 1.0	R535	ERDS2TJ332	1/4W 3.3K	R708	ERDS2TJ472	1/4W 4.7K
			R537	ERDS2TJ472	1/4W 4.7K	R709	ERDS2TJ821	1/4W 820
			R538	ERDS2TJ183T	1/4W 18K	R710	ERDS2TJ102	1/4W 1K
			R539	ERDS2TJ333	1/4W 33K	R711	ERDS2TJ122	1/4W 1.2K

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
R712	ERDS2TJ152	1/4W 1.5K	C303, 304	ECBT1H561KB5	50V 560P	C617	ECBT1E103ZF	25V 0.01U
R713	ERDS2TJ182	1/4W 1.8K	C305, 306	ECQB1H103JF3	50V 0.01U	C618-621	ECEA1AU471	10V 470U
R714	ERDS2TJ222	1/4W 2.2K	C307, 308	ECQB1H223JF3	50V 0.022U	C622	ECBT1E103ZF	25V 0.01U
R715	ERDS2TJ332	1/4W 3.3K	C309, 310	ECQV1H563JM3	50V 0.056U	C701	ECBT1E103ZF	25V 0.01U
R716	ERDS2TJ472	1/4W 4.7K	C311, 312	ECBT1H121KB5	50V 120P	C702, 703	ECEA1HKA010B	50V 1U
R717	ERDS2TJ682T	1/4W 6.8K	C313, 314	ECKR2H821KB5	500V 820P	C704-706	ECBT1E103ZF	25V 0.01U
R718	ERDS2TJ123	1/4W 12K	C315, 316	ECBT1E223ZF	25V 0.022U			
R719	ERDS2TJ472	1/4W 4.7K	C317	ECBT1H220J5	50V 22P			
R720, 721	ERDS2TJ102	1/4W 1K	C318	ECQP1153JZ	100V 0.015U			
R722, 723	ERDS2TJ562	1/4W 5.6K	C320	ECBT1H220J5	50V 22P			
R725, 726	ERDS2TJ180T	1/4W 18	C324	ECEA1EKA4R7B	25V 4.7U			
R730, 731	ERDS2TJ104	1/4W 100K	C325	ECKR1H392KB5	50V 3900P			
R735	ERDS2EJ121	1/4W 120	C327	ECKW1H222KB5	50V 2200P			
R736	ERDS2TJ472	1/4W 4.7K	C328	ECKD1H682KB	50V 6800P			
R737	ERDS2TJ471	1/4W 470	C329	ECKW1H222KB5	50V 2200P			
R738	ERDS2TJ472	1/4W 4.7K	C330-332	ECBT1E103ZF	25V 0.01U			
R739, 740	ERDS2TJ333	1/4W 33K	C401, 402	ECBT1C222KR5	16V 2200P			
R971	ERDS2TJ221	1/4W 220	C403, 404	ECEA1EKA4R7B	25V 4.7U			
R972	ERDS2TJ183T	1/4W 18K	C405-408	ECEA1HKA010B	50V 1U			
R973	ERDS2TJ221T	1/4W 220	C409, 410	ECQB1H152JF3	50V 1500P			
R974	ERDS2TJ183T	1/4W 18K	C411, 412	ECEA1HKAR47B	50V 0.47U			
			C413, 414	ECQB1H152JF3	50V 1500P			
		CAPACITORS	C415, 416	ECEA1HKAR47B	50V 0.47U			
			C417	ECEA1CKA100B	16V 10U			
C1, 2	ECBT1H181KB5	50V 180P	C418	ECEA1HKA010B	50V 1U			
C3, 4	ECEA1AU101	10V 100U	C420	ECEA1CN100SB	16V 10U			
C5, 6	ECQB1H682JF3	50V 6800P	C421, 422	ECEA1HKAR47B	50V 0.47U			
C7, 8	ECBT1E103ZF	25V 0.01U	C423, 424	ECQB1H152JF3	50V 1500P			
C9, 10	ECBT1H391KB5	50V 390P	C425, 426	ECEA1HKAR47B	50V 0.47U			
C11, 12	ECBT1C392KR5	16V 3900P	C427, 428	ECQB1H152JF3	50V 1500P			
C13, 14	ECQV1H124JM3	50V 0.12U	C429, 430	ECEA1EKA4R7B	25V 4.7U			
C15, 16	ECEA1HKA010B	50V 1U	C431, 432	ECBT1C122KR5	16V 1200P			
C17	ECEA1HKAR47B	50V 0.47U	C433, 434	ECBT1C152KR5	16V 1500P			
C18	ECEA1CKA100B	16V 10U	C501, 502	ECEA1CKA100B	16V 10U			
C19, 20	ECKR2H121KB5	500V 120P	C503	ECEA1HKA010B	50V 1U			
C23, 24	ECEA1EKA4R7B	25V 4.7U	C504	ECEA1EKA4R7B	25V 4.7U			
C27, 28	ECEA1CN100SB	16V 10U	C505-507	ECEA1CKA100B	16V 10U			
C29, 30	ECEA1HKAR33B	50V 0.33U	C508, 509	ECEA1CN100SB	16V 10U			
C31, 32	ECEA1HKA2R2B	50V 2.2U	C510	ECBT1E103ZF	25V 0.01U			
C33, 34	ECEA1CKA100B	16V 10U	C511	ECEA1AKA220B	10V 22U			
C35, 36	ECEA1CKA220B	16V 22U	C512	ECBT1E103ZF	25V 0.01U			
C37	ECQB1H392JF3	50V 3900P	C601	ECKR2H682PE	500V 6800P			
C38	ECBT1H331KB5	50V 330P	C602	ECA1EM102B	25V 1000U △			
C39, 40	ECEA1CKA220B	16V 22U	C603	ECA1HM470B	50V 47U △			
C41, 42	ECBT1E103ZF	25V 0.01U	C604	ECKR2H682PE	500V 6800P			
C43, 44	ECEA1HKA010B	50V 1U	C605	ECEA1EU222	25V 2200U △			
C45, 46	ECEA1CKA100B	16V 10U	C606	ECA1EM102B	25V 1000U △			
C51, 52	ECEA1AU101	10V 100U	C607, 608	ECBT1E103ZF	25V 0.01U			
C53, 54	ECBT1H101KB5	50V 100P	C609	ECEA1AU221	10V 220U			
C151	ECA0JM471B	6.3V 470U	C610	ECEA1AU471	10V 470U			
C152	ECBT1E103ZF	25V 0.01U	C611-615	ECBT1E103ZF	25V 0.01U			
C302	ECEA1CKA100B	16V 10U	C616	ECA0JM222B	6.3V 2200U			